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JOURNAL
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VOL. XI. JULY, 1927 No. 3.

FORECASTING THE PRICE OF WHEAT[1]

HOLBROOK WORKING
FOOD RESEARCH INSTITUTE

There seems to be a fairly general impression abroad that it is not very difficult to forecast changes in the price of wheat quite accurately if only one can hit on the right formula. One does not have to seek far to find many who are convinced that others have this formula, and not a few who believe they have it themselves. Perhaps I should not call it a formula; this requisite for accurate forecasting is more commonly thought of as a superior judgment or a special gift like that possessed by prophets, oracles, and soothsayers. But whether the requisite is a formula or gift, its possession is thought to reduce price forecasting to an easy and relatively certain, not to say highly lucrative, art.

Even economists may be suspected of holding the view that price forecasting is not difficult for a person of intelligence who cares to devote the necessary attention to the facts of the market. Not that many economists have attempted actual price forecasting, but most discussions of the merits of speculation seem to suggest such an opinion. Statements that stress the advantage of making it possible for prices to be fixed primarily by the trading of those who are specializing on the study of the market situation frequently suggest the opinion that these specialists know very accurately what the price ought to be.

[1] This paper was read at the seventeenth annual meeting of the American Farm Economic Association held at St. Louis, December 30, 1926.

To others, and among them some who have studied price movements long and closely, forecasting the price of wheat does not seem so easy. One of the largest grain dealers in Minneapolis, asked recently whether he knew of many elevator operators who attempted to forecast the movements of wheat prices, replied, "Yes, a good many elevator owners have tried it, but most of them have lost their elevators."

The present paper does not attempt to present a new method of forecasting wheat prices, but rather aims to summarize the principal bases for current price forecasts, to examine the function and value of each, and to make some contribution toward developing the methods for judging what price is justified by fundamental conditions as they appear at any given time.

Bases of Price Forecasts

The practical forecasts of wheat prices on which traders base their actions are founded on a wide range of considerations, including judgment of the technical position of the market, the psychology of other traders, and forecasts of market news. But in all these forecasts most traders include a consideration of their estimate of the fundamental demand and supply situation, the result of what is commonly called an analysis of the statistical position. The estimate of the price justified by fundamental conditions occasionally plays the dominant part in determining the decisions of traders. Usually it is but one among several factors considered. But in the great majority of cases traders consider a sound estimate of the price justified by existing fundamental conditions as an important element in any forecast of probable price changes.

From the broader view of the public interest an accurate basis for estimating the price justified by fundamental conditions is even more important than for the traders. Only in so far as it becomes possible accurately to gauge the price so justified will it become possible to eliminate the evils of erratic and unnecessary fluctuations in prices.

Published Studies of Effect of Fundamental Conditions

The formal statistical studies thus far made to determine the relationship between the price of wheat and fundamental conditions have aimed principally at a measurement of the quantitative relationship between supplies and price.[2] The quantitative determinations have remained inconclusive, however, because of the low correlations obtained. Attention has been given also to the relation between the price of wheat and the general price level and in at least two cases, some attempt has been made to find other factors influencing price and to measure their effect. The fact has been clearly established that the price of wheat tends to move quite closely with the general wholesale price level in the larger movements of the price level, but apparently not in the smaller movements characteristic of the business cycle.[3] It seems clear, however, that there remain other factors, important in the aggregate if not individually, the nature and influence of which have not yet been shown in any published statistical studies. Until the more important of these other factors have been discovered and their influence measured, price forecasts based upon an analysis of fundamental conditions must remain very uncertain and a considerable margin of error must be recognized in the measurements of the influence of changes in supplies.

During the past year year and a half I have been endeavoring with the support and counsel of the directors of the Food Research Institute, to accumulate evidence which should indicate what are the more important factors that require consideration and what methods of attack the situation requires. The results will be of some little interest, I believe, to economists generally, and particularly to agricultural economists.

---

[2] Bosland, C. C., "Forecasting the Price of Wheat," *Journal of the American Statistical Association*, June, 1926, XXI, 149-161.
Killough, Hugh B., "What Makes the Price of Oats," *U. S. D. A. Bulletin No. 1351*, September, 1925. (Includes a brief study of wheat prices.)
Lehfeldt, R. A., "The Elasticity of Demand for Wheat," *Economic Journal*, June, 1914, XXIV, 212-217.
U. S. Dept. of Agriculture, "A Method of Estimating the May Price of Spring Wheat," *Foreign Crops and Markets*, May 11, 1925, X, 549-552.

[3] The conclusion that the price of wheat does not move with the general price level in the movements characteristic of the business cycle rests on Lehfeldt's study, cited above, and on an opinion prevalent in the trade that depression in business makes for increased demand for flour and wheat.

The Demand Curve

Clearly the most important single factor in the changes in wheat prices from year to year is the varying "world" supply of wheat. In general, large supplies will be taken only at low prices and when supplies are short, high prices will be bid for the wheat that is available. The problem in any year is to find the price that will equate the quantity demanded with the available supplies.

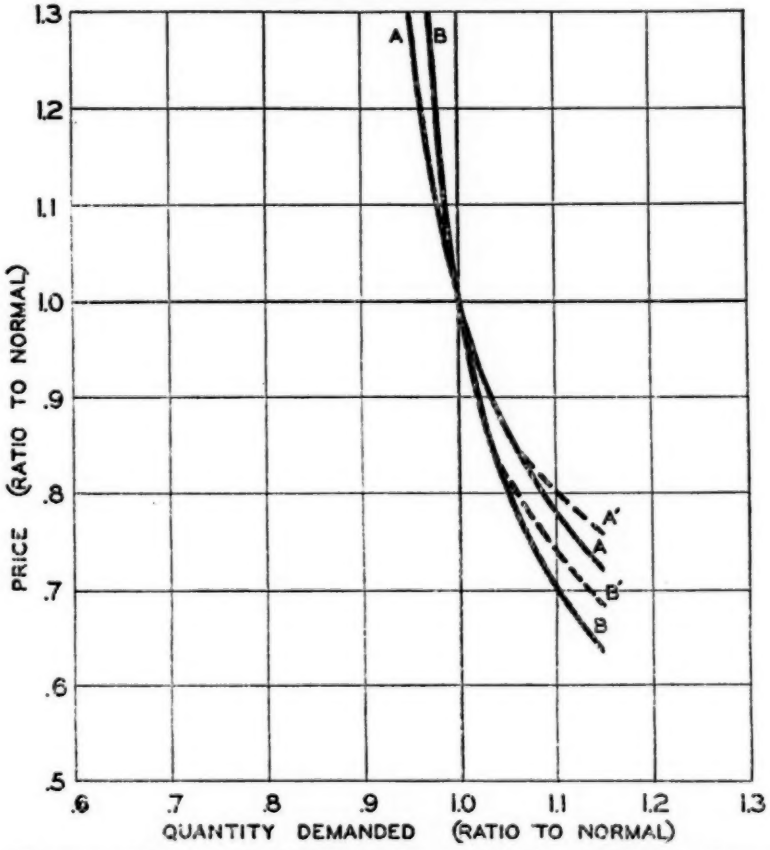
We need to distinguish, however, two different demand curves: the consumption demand curve, which represents the quantities that will be consumed at various prices, and the total demand curve, which represents the quantities that will be consumed, plus the quantities that will be placed in storage for consumption in a future season, at various prices. The solid curves, A and B, on the accompanying chart represent respectively the most elastic and the least elastic consumption demand curves which it seems reasonable to suppose in view of known facts. Limitations of time forbid presentation of the evidence on which these curves are based; suffice it to say that I believe the actual consumption demand curve lies somewhere between these two limiting positions.

Quantities and prices in Chart I are expressed in terms of ratios to normal and in the discussion to follow there will be much reference to normal price and normal demand. Statistical studies of time series in economics have clearly demonstrated the validity of the concept of a normal changing through time, but it is seldom easy to give a rigorous definition of these normals except in purely statistical terms. For present purposes the term normal price may be accepted in the sense of Alfred Marshall's long-time normal and normal demand may be defined as the quantity that would be consumed at a normal price.

Given a large supply of wheat available or in prospect in one year, say at the extreme, 10 per cent above normal, the two limiting consumption demand curves shown in Chart I indicate that if that quantity of wheat is to be consumed within the current year, the price must be between

70 and 78 per cent of normal. At such prices, however, there arises a prospect of profit from carrying part of the current supplies into the next year, or longer. The profit actually realized will depend on the crops of the succeeding year or years, and in strict accuracy consideration should be given the respective probabilities of various harvests in

CHART I—EFFECT OF RATIONAL STORAGE ON WORLD DEMAND FOR WHEAT



In years of large crops the demand for wheat for speculative storage supports the price appreciably. The exact form of the consumption demand curve is not known, but it probably lies between the curves A and B. The distance between these curves and the corresponding dotted curves, A' and B' shows the approximate possible influence of rational storage.

the succeeding years. For present purposes, however, it will be sufficient to consider that at the time one crop is being harvested it is reasonable to act on the assumption that crops of succeeding years will be normal. As noted above, if all of the available supplies are to be consumed during the current year, when they are 10 per cent in excess of normal, the price must drop to something like 70 or 78 per cent of normal. Assuming such complete consumption of current supplies, the price next year will be expected to be normal and the prospect of profit from carrying wheat so that not all the current supplies need be consumed in the current year is obvious.

The price at which the prospect of such a profit will appear depends on the cost of carrying wheat. Data on costs of carrying wheat in elevators, collected by the Federal Trade Commission,[4] and study of the practices of elevators in buying wheat for storage for the carrying charge when the distant options are at a considerable premium over the near option, indicates that wheat will be carried for a year in large quantities for a return of something like 15 per cent of the normal price of wheat. This implies a cost of about 15 cents a bushel under pre-war conditions.

If 15 per cent of the normal price be the true necessary return for carrying wheat for one year, buying of wheat in the early fall with a view to carrying it into the next year, if necessary, should begin when the price falls below 85 per cent of normal, provided the crop be not greatly in excess of normal.[5] If the crop be so large that a price 85 per cent of normal would result in a large carryover into the next year, the price in the following year will thereby be reduced and it is only at a price considerably below 85 per cent of normal that there will be promise of profit from purchase of wheat for carrying into a subsequent year. It is not difficult, however, to calculate the crops which would justify the various possible prices under the conditions stated. The calculations yield the two curves shown in Chart I as dotted

[4] *Report on the Grain Trade*, vol. VI, pp. 194ff.

[5] For simplicity I am neglecting here the fact that there is a seasonal variation in price. Taking this into consideration the statement would have to run "when the price falls below the level which should accompany a seasonal average 85 per cent of normal."

lines. These dotted lines, continued upward in the solid lines with which they connect, represent the curves of total demand which should logically accompany the curves of consumption demand shown. Whether or not these theoretical curves accurately represent the relation of total demand to the true curve of consumption demand depends largely on the degree to which rational considerations determine the amount of wheat held over from years of large supplies for subsequent consumption. Evidence on this point will be treated in another connection.[6]

For present purposes this study of the influence of rational storage of wheat is significant in demonstrating that in years of very large crops such storage may hold prices some three to five per cent above the levels to which they would fall if all the available supplies had to be consumed in the current year, as is the case with potatoes. Speaking in general terms, one may say that rational storage of wheat in years of very large world crops may exercise a significant, but not a highly important influence on prices.

One other conclusion of significance may be drawn from the foregoing study of rational storage. It has been suggested that in years of large crops, part of the surplus should be held and distributed over several years. It now appears that there would never be prospect of profit from carrying stocks for more than one year unless the costs of carrying were much below the figure here used or the crop much farther above normal than any produced in the last 30 years. If the cost per bushel per year for carrying wheat in storage is 15 per cent of the normal price, a prospect of profit from carrying for two years would arise only when the price had fallen to 70 per cent of normal. Such a situation appears very unlikely to arise.

Changes in Position of the Demand Curve

If a demand curve such as one of those shown in Chart I is to be put to practical use in judging the price justified in a given situation, it becomes necessary to determine specif-

[6] Cf. p. 285, below.

ically what is a normal demand in any given year. A world wheat crop of 3,500,000,000 bushels is extremely large if the normal demand at the time is 3,200,000,000 bushels, but small if the normal is 3,600,000,000. In many statistical problems it has been found satisfactory to fit a relatively simple secular trend to the data and to use the ordinates of this trend as normals from which to measure deviations. This method assumes that the normal is changing at a uniform rate (a straight line) or in some other equally regular fashion. This assumed condition seems to be at least approximately fulfilled in a great number of cases and in many cases only approximate fulfillment is necessary. If the deviations from trend run frequently to fifty per cent, a small divergence of the trend from the true normal will have little effect on the results. But in the case of world wheat production the extreme deviation from trend is about 10 per cent and the majority of years show deviations in the neighborhood of 5 per cent or less. In such a situation it is essential that the normal for each year be determined with a high degree of accuracy.

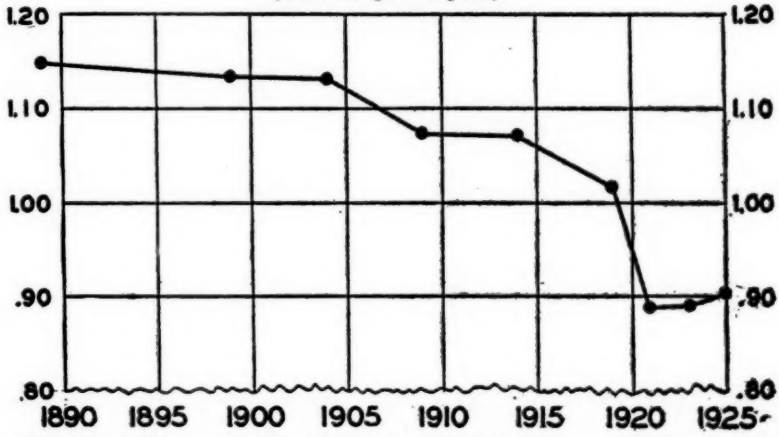
Data on consumption of wheat in the form of flour in the United States, recently compiled by the Bureau of Agricultural Economics of the U. S. Department of Agriculture, show a sharp and irregular decline in per capita consumption since 1904. The data are shown graphically in Chart II. After investigating the general evidence as to the probable accuracy of these data we undertook last winter's study of the causes of the decline and found convincing evidence of both the general fact and of the substantial accuracy of the details.[7] The decline in per capita consumption of wheat in form of flour did not take the form of a steady downward trend, but included a sharp break between 1919 and 1921, amounting to about 12 per cent. This break we found to have arisen chiefly from causes, reflected also in the consumption of other foods, which exhausted their influence in a short time. The causes responsible for the decline prior to 1919 are still in operation, though with somewhat altered force, and I feel confident in the prediction that per capita

[7] *Wheat Studies*, II, 8, July, 1926.

consumption of flour in the United States will decline further, though in moderate amount, during the next few years.[8]

The post-war years are believed to have seen notable changes in flour consumption in Europe also, upward in some countries, downward in others, though reliable statistical data are lacking except for England. Even more clearly convincing is the evidence of increased demand for flour in the Orient in recent years.

CHART II—APPARENT CONSUMPTION OF FLOUR, IN THE UNITED STATES, 1889-1925
(*Barrels per capita*)



Changes in flour consumption in the United States indicate that the consumption of wheat in the form of flour is little affected by price changes, but is subject to important and quite irregular changes from other causes.

All of these changes, some of them clearly irregular, point to the need of detailed statistical studies of flour consumption if we are to have a basis for determining accurately the normal demand for wheat in any year. The normal must be determined very accurately if we are to have a reliable basis for estimating the price of wheat justified by fundamental conditions in any given situation and the simple method of fitting a secular trend to the data over an extended period

[8] The advertising campaign recently inaugurated by millers and bakers has introduced a new element into the situation, the effect of which is still problematical.

will not serve. The changes in the normal demand for wheat must be followed in detail, country by country.

Shifts in Form of the Demand Curve

Another question that deserves to be raised in examining the price of wheat justified by fundamental conditions, is whether the consumption demand curve may properly be assumed to retain the same shape year after year. On this point I have not yet obtained any concrete data, but it seems fairly clear that there may be significant changes in the form of the consumption demand curve from year to year. Some of these changes may be progressive, such as might arise from a gradual increase in the general level of prosperity in European countries, permitting them to neglect increases in price of flour and bread which now lead to substitution of other foods.

Probably the more important of these changes in form of the demand curve are irregular and affect only the lower portion of the curve, arising from variation in use of wheat for feed. There are many portions of the United States and Canada and probably of other countries where the lower grades of wheat are ordinarily not much more expensive than feed grains per calorie, and it seems clear that in years of high prices of feed grains the demand for wheat for feed in these sections must be very elastic at low prices. In other years the same low prices of wheat may meet even lower prices of feed grains and the demand for wheat remain inelastic even at low prices. The quality of the crop is also important, for in years when there is much poor wheat, feed wheat may be unusually cheap relative to standard bread wheat.

For lack of adequate data this discussion of changes in the form of the demand curve must remain almost purely hypothetical, but the evidence points to a strong probability that the subject needs investigation. The first need is for collection of statistical data. We need data for other countries on flour consumption similar to those now available for the United States, and even more we need data on the use of wheat for feed. Even the United States has no statis-

tics on the fluctuations in consumption of wheat for feed and the only evidence of the average consumption is of very doubtful accuracy.

Research on the use of wheat for feed need not wait on the slow process of accumulating official statistics over a period of years, however. Some very good indications of the extent to which wheat takes the place of the usual feed grains in various price situations ought to be obtainable from records of individual farmers and feed dealers.

Estimates of Available Supplies

Give the best obtainable information as to the amounts of wheat that will probably be demanded at various prices, the first step in arriving at an estimate of the price justified by fundamental conditions is to determine the quantity of wheat that will become available during the current season. The total supply is composed of two items, the crop of the current year and the stocks carried over from the previous year. Not all of this total, however, may be considered as actually available during the current year, for some will certainly be carried over into the subsequent crop year. Each of these three items—opening stocks, the crop, and the probable year-end stocks—deserves consideration.

Production Estimates and Forecasts

Perhaps the need for improved crop estimates is obvious enough to need no discussion here. It may not be out of place, however, to present some evidence as to the magnitude of the errors that may be involved.

Among the principal wheat exporting countries aside from the United States, Canada probably has the most adequate crop estimating system, yet in 1924 the Northwest Grain Dealers' Association of Canada placed the crop of the prairie provinces over six per cent above the official estimates and the disposition data seemed to support the larger figure. In many countries the basis for the crop estimates appears less adequate than that for the crop estimates of the United States 30 years ago. We recently undertook a revision of earlier estimates of the wheat crops of the United States,

based largely on disposition data which seemed to be quite trustworthy, and found that during the early nineties of the last century the official estimates of the crops need to be raised beween 30 and 40 per cent.[9] The errors arose largely from defects in the decennial census of 1890. Perhaps those countries which lack a general census of agriculture have not fallen into such grievous errors, lacking the temptation to place undue confidence in an instrument of measurement which, under certain conditions, may prove so untrustworthy, but one cannot avoid the suspicion that estimates of world production of wheat may be subject to very important errors.

At the time the earlier portion of one year's crop is being harvested, the estimates of probable harvest in many other regions are no more than forecasts. Such forecasts are subject to changes, in consequence of later developments affecting the crop, and they are also subject at present to avoidable errors from mistaken appraisals of the existing condition of the crop. There is much room for improvement in advance estimates of crops.

Carryover from Previous Year

Accurate data on stocks of wheat, at the beginning of each crop year at least, are just as essential for reliable price judgments as accurate data on production. Yet outside of the United States and Canada we know almost exactly nothing about wheat stocks. Even for the United States and Canada the data have been far from complete, though with the improved data on elevator stocks now being collected by the Department of Agriculture and the data on mill stocks being collected by the Department of Commerce we are approaching a complete statement of year-end stocks for the United States.

The belief is frequently stated or implied that year-end stocks are seldom large enough to constitute an important factor in the situation. If conditions in the United States are at all representative, however, this is far from the case. Out of the 32 years for which sufficient data are available to

[9] *Wheat Studies*, II, 7, June, 1926.

justify an estimate, it appears that there were four in which reductions in stocks between the beginning and the end of the crop year added 75,000,000 bushels or more to the supplies available for domestic consumption in the United States or for export. There were only six years during the same period in which increases in size of crop added as much as this to available supplies.

Considering the inaccuracy of the estimates of world production of wheat and the inadequacy, amounting almost to complete absence, of data on year-end stocks of wheat, it becomes apparent that there is a wide margin of possible error in estimates of wheat supplies available for consumption in a given year. The seriousness of these errors, however, for purposes of price judgments, may not be apparent at once. Consider the consequences of an overestimate of 3 per cent in the calculation of the quantity of wheat available in a year of short supplies. Even on the basis of the most elastic demand which it seems reasonable to assume, represented by Curve A in Chart I, p. 277, a difference of 3 per cent in the amount of wheat available in a year of short supplies would make a difference of 15 or 20 per cent in the price justified by the situation.

This picture of the doubtful reliability of estimates of available supplies and the consequent gross unreliability of calculations of expected price under such conditions may seem to argue the uselessness of such estimates. The one final answer to this opinion is that such estimates cannot be avoided. The lesson to be drawn seems obvious: if we are to have any sound basis upon which the market can fix a price intelligently and with promise of reasonable stability through the season, it is essential to have better crop estimates and greatly extended and improved data on year-end stocks of wheat. Meanwhile we must make the best we can of such data as are available.

Expected Carryover Out

Knowing, as accurately as possible, the supplies of wheat on hand, carried over from the previous year, and added by the estimated crop of the current year, one may not assume that this amount will be available for consumption before

the end of the season. There is a fairly definite minimum below which year-end stocks may not safely be reduced. More important in most years than this irreducible minimum, however, is a large element of year-end stocks which varies irrationally. Farmers frequently carry large stocks of wheat into a new crop year even when there is every indication that they must lose by so doing.

Commercial stocks seem to fluctuate in a sufficiently rational manner to justify basing price judgments early in the season on the assumption that year-end stocks in elevators and other trade hands will be governed quite closely by intelligent estimates of the probable profit from carrying wheat into a new crop year. Some investigation of the subject might not be amiss, however. If the rational behavior of commercial stocks be demonstrated, the demand for wheat for storing in such positions in years of low prices may be treated as a function of the price, as implied by the total demand curves shown in Chart I.

Until farmers change their habits, however, year-end stocks of wheat on farms cannot be treated as primarily dependent on price. The probable changes in farm stocks must be calculated each year on the basis of a variety of factors, among which the level of wheat prices is in most years unimportant.[10]

Forecasts of Crop of Succeeding Year

Finally, one additional point should be made. We have dealt thus far only with the problem of estimating the price justified by fundamental conditions as they appear at the time the crop is being harvested. In years of short supplies the developing prospects for the next year's crop may deserve to have no influence on the judgment of the price justified for the current year and the only changes in judgments may be those arising from altered opinions as to the supplies actually available or as to the rate of consumption. But in years of large supplies when it is expected that substantial stocks will be carried into the succeeding crop year, every

[10] Since this paper was prepared, evidence has been obtained which calls for a qualification of this statement. Further study has revealed the necessity of an adjustment in the estimates of farm stocks July 1 for years prior to 1907 to render them comparable with subsequent estimates, and when this adjustment is made the behavior of farm stocks appears more nearly rational.

change that affects the prospects for the new crop and the price at which it will sell deserves to affect equally the present price of wheat. Under such conditions the present price implies a forecast of the price a year later. It is frequently important, therefore, to have as reliable a basis as possible for forecasting crops long in advance. Here is a fruitful field for research for those interested in the relation of the weather to the size of crops to be harvested many months later.

Summary

In conclusion I may summarize briefly the points I have tried to make. Practical forecasting of the price of wheat requires consideration of a great variety of influences bearing on prices. Among the most important of these are the fundamental demand and supply conditions.

Existing statistical studies of the relation between price and fundamental conditions indicate that the problem is so complicated as to require more refined and detailed investigation than it has thus far been given. Exploring the field to determine what factors require first consideration and what methods promise to be useful, it appears first of all that there are serious deficiencies and defects in the statistical data available. There is need for better estimates of the size of recently harvested crops, of the quality of the crops, and of the probable yields and quality of crops which are still growing; there is urgent need for more complete and adequate data on year-end stocks in all positions; and there is need for much more data on consumption of wheat both for human food and for feed.

In the way of statistical analysis, it is clear that we need studies from which to judge accurately the normal demand for wheat in the current year; studies from which to judge the probable form of the consumption demand curve as affected by probable substitutions between wheat and other foods and feeds under conditions prevailing in the given year; studies of the return that must be offered to induce commercial storage of wheat in years of large supplies; and studies of the factors that determine the quantities of wheat carried on farms from one year to the next.

THE NATURE AND MEASUREMENT OF THE ELASTICITY OF SUPPLY OF FARM PRODUCTS

F. F. ELLIOTT
BUREAU OF AGRICULTURAL ECONOMICS

By elasticity of supply is meant the extent to which supply changes with given changes in price. It has long been recognized that for most commodities there is a direct relation between changes in price and changes in supply. In fact, the whole theory of equilibrium price from the time of the classical economists down to the present has presumed such a relationship. Distinction, however, has been made by certain writers between the short-time and long-time viewpoints.

When considering elasticity of supply in the short-time or market sense, it is important to differentiate between two different market situations. In both cases the supply is already produced and in existence, but in the one case the supply is already in the market place and may be considered fixed for the time being, as for a particular day or fraction thereof, while in the other case the supply is variable from day to day, "flowing" to market with greater or lesser rapidity as the price offers change.

The elasticity of supply in the first case is very closely akin to elasticity of demand. They both refer to the behavior of individuals *within* a market. The reactions exercised between changes in price and changes in quantities demanded or supplied are presumed to come about immediately. The buyers' offers resolve themselves into a series of prices which they will be willing to pay for different quantities of the good, and the sellers' acceptances into a series of quantities they are willing to sell at varying prices. Both groups have their reservation prices and are balancing the utilities or advantages in one direction against those in another.

That the reactions of the two groups are similar seems clear. Wicksteed, in fact, has gone so far as to say they are one and the same thing, in that the so-called supply schedule is in reality a demand schedule of those who possess the commodity (the sellers) "* * * for it shows the exact place

which every successive unit of the commodity holds in their relative scale of estimates." [1]

Most of the theoretical discussions of elasticity, both of supply and demand, have placed major emphasis upon the short-time viewpoint. The distinction, according to Professor Marshall,[2] is quite valid for supply but has no particular significance for demand. He says in part as follows: "* * * there is to be noted an important difference between demand and supply. A fall in price, at which a commodity is offered, acts on demand always in one direction. The amount of the commodity demanded may increase much or little according as the demand is elastic or inelastic * * * if exceptional cases in which a thing is driven out of fashion by a fall in its price be neglected—the influence of price on demand is similar in character for all commodities, and further, those demands which show a high elasticity in the long run, show a high elasticity almost at once, so that, subject to a few exceptions, we may speak of the demand for a commodity as being of high or low elasticity without specifying how far we are looking ahead."

"But there are no such simple rules with regard to supply. *An increase in the price offered by producers does indeed always increase supply;* and thus it is true, if we have regard to short periods only, and especially to transactions of a dealers' market, there is an 'elasticity of supply' which corresponds closely to elasticity of demand. * * * a given rise in price will cause a great or a small increase in the offers which sellers accept, according as they have large or small reserves in the background and as they have formed low or high estimates of the level of prices at the next market, and this rule applies nearly in the same way to things which have a tendency to diminishing return as to those which have a tendency to increasing return."

When longer periods are taken into consideration, however, as Marshall points out in the discussion later on, the relation between change in price and changes in subsequent supply is not so clear-cut and simple. Also the universality

[1] P. H. Wicksteed—The Scope and Method of Political Economy in the Light of the Marginal Theory of Value—Economic Journal, March, 1914.
[2] Marshall's Principles of Economics, Book V, Edition 8, Chapter 7, pp 455-457.

of Marshall's statement that *"having regard to short periods only an increase in the price always causes an increase in the supply"* may be questioned. It is conceivable that an increase in price may have little if any effect upon the supply offered, if by short periods is meant the period of a few days. A case in point may be cited from the wheat market.

Suppose that a large part of the annual crop of wheat is still in the hands of farmers who are on the margin of doubt whether to hold the wheat for a later market or to sell immediately. Under such circumstances a rise in the price of wheat might at first cause a big movement to market and this movement might continue for some time if the price remained favorable. A continued increase in the price, however, instead of resulting in accelerated receipts might conceivably cause a slowing up or a complete cessation. This is true for the reason that farmers believing the price will continue to rise will hold off and send in later in the hope of taking advantage of an expected higher price.

In considering elasticity of supply in the long-time sense, the problem becomes one of determining the relation not between changes in price and changes in a supply already produced and in the market or ready to go to market, but rather between changes in price and changes in supply yet to be reduced and which subsequently will come to market. In this sense a change in price does not result in a change in supply immediately. There is a "time lag" which must be taken into consideration and this lag varies not only for different commodities but for the same commodity under different conditions. It is in connection wth this lag that many of the most difficult problems arise in arriving at a quantitative measure of elasticity of supply.

Before getting into a detailed consideration of the measurement of elasticity of supply, however, it may be well to discuss first another phase of the problem, which touches it very closely and a consideration of which will clarify the other. This has to do with the nature of elasticity of supply in general and the factors which affect it to a consideration of which we now turn.

There are a good many factors which affect the response which producers will make to given price changes, some of

the more important of those affecting agricultural production are as follows: nature of the industry or enterprise, "price sensitiveness" of the producers, possibilities of engaging in alternative lines of production, custom, conditions of tenure, price of cost factors, publicity campaigns, tariffs, bounties, etc.

Variations in production to given price changes likely will come about much more quickly in manufacturing industries than in extractive industries like agriculture. Industrial concerns can exercise a larger measure of control in expanding or contracting production and can do so in comparatively short periods. In an industry like agriculture which is so dependent upon the changeableness of the climate, shifts in production plans are more difficult to make. In fact once the crop is planted the producer must await the harvest and chance the consequences. In the meantime the price situation may have changed completely. In certain types of livestock production like steer and hog feeding, however, there is more flexibility and the shifts may be made more readily.

The elasticity of supply of certain agricultural products also differs from that of other products because of inherent differences in the nature of the enterprise. It is quite probable that the response of producers to changes in the price of annual crops will differ from the response of producers of perennial crops. Also it will differ as between enterprises which require large initial outlays and those where such are unnecessary or for enterprises which entail considerable waiting for returns against those which come to fruition at once. Where there is a considerable lapse of time between initial investment and first returns producers are likely to be more cautious in responding to price changes, although the manner in which apple growers have boosted their plantings during past years seems to belie this.

In general, for studies on elasticity of supply which have been completed, changes in the prices of farm crops tend to result in greater changes in supply than do the changes in livestock prices. It should be pointed out, however, that this is true when the price of one product changes and the price of other products remain unchanged. Were the prices of all

farm products to advance simultaneously then it could not be expected that production of an individual product would increase anything like to the extent these results might otherwise indicate.

In agriculture increases in production to price changes usually take place in one product at the expense of some other, rather than in a general increase all along the line. Hence the elasticity or response in production of a particular commodity is influenced by the possibilities of engaging in other lines of production. If the opportunities in alternative lines of production are limited the producers of the particular commodity likely will tend to respond less quickly to given changes in price than they will if numerous alternatives are accessible. Peculiar conditions of soil, climate and topography, or location with respect to a given market, may retard shifting to other lines of production or possibly prevent it altogether.

Under conditions such as these, shifts in production take place, to be sure, but they are likely to be different and also to be made less quickly than they would be if there were opportunities in alternative fields available. For this reason one would not expect the elasticity of supply of wheat, for example, to be the same in Western Kansas, Nebraska and Montana as it is in Illinois and Missouri.

In a study of factors determining the acreage of wheat, Daggit[3] for example, found that the ratio of the acre value of wheat to the acre value of alternative grains was much more influential in determining fluctuations in wheat acreage in the hard spring wheat states than in the hard winter wheat states.

Similarly in a study of the elasticity of supply of hogs the writer[4] found that corn prices as well as hog prices had to be taken into account to give satisfactory results. Also that the elasticity of supply varied in different types of farming areas. In a study in different type of farming areas in Illinois hog production was much more elastic in the grain farming section of the East-Central part of the state than in the dairy section in the Northern part of the state or in the livestock and wheat sections in the Western and Southwestern parts of the state.

[3] Unpublished.

[4] Illinois Bulletin No. 293 (in press) Adjusting Hog Production to Market Demand. Also the Elasticity of Supply of Hogs, Thesis filed Library University of Wisconsin by F. F. Elliott.

In the same study it was also found that hog production in all the sections as well as in the entire Chicago market area was relatively more inelastic when the level of prices (corn-hog ratio) was high than when it was low. It is likely that a somewhat similar situation will be found for other products.

The variations in elasticity found in these studies both in adjacent and distant areas to given changes in price suggest the advisability of localizing such studies as much as possible if most satisfactory results are to be obtained.

How "price sensitive" the producers of a particular commodity are is still another factor which will cause variations in elasticity. How quickly producers will change their production in response to price changes will depend in part upon how keen is the competition and in part upon their ability to sense and capitalize upon the possibility of increasing their profits by so doing. One of the reasons why the lag between price incidence and price effect is as long as it is arises from the fact that producers do not know whether prices for any given year are high or low for the given volume of production. If they could interpret more definitely just what a particular price means at a given time their response would be other than it is.

A high price resulting from low yields due to climatic catastrophes, for example, likely will not result in an increase in production the next year to the same extent as would result if the high price were caused by a steady upward trend in demand. Hence a duration in price may affect production more than a sudden change in price even though the change be marked.

Then, too, of course, producers vary widely in their abilities and opportunities. They are not all producing under the same conditions and financial circumstances. Some producers are more alert in seeking profits than others and will make an effort to capitalize upon every economic advantage open to them. Hence they will respond in their production to given changes in price very quickly and are very "price sensitive." Others through lack of financial

pressure or because they feel less keenly the acquisitive urge will respond more slowly.

There are a number of other factors (not necessarily related but grouped here for convenience) such as custom, conditions of tenure, changes in price of the cost factors, inventions and changes in technique, publicity campaigns, tariffs, bounties, etc., that may affect the elasticity of supply of a particular product.

While custom plays a much smaller role in production these days than in former times it still probably has some influence in certain lines of agricultural production. This inertia to change wherever it exists will affect the response of production to outside stimuli, be they price or what not.

Also the conditions of tenure may have an important influence upon both the amount and rapidity of the response in production to given price changes. For instance, this influence may take the form of lack of complete freedom of choice on the part of a tenant or it may result from the pressure of an encumbered title or through lack of sufficient working capital.

Tenant operators do not always have freedom of choice in selecting either the amounts or proportions of the crop and likestock enterprises they will handle. Hence their response in production to give price changes may be entirely different from what it would be were they not so restrained.

An encumbered owner will be disposed to push his resources to the highest limits (margin) of profitableness. He will be inclined to make shifts in production with every change in the price of either the particular enterprise or alternative enterprises if he sees a chance to increase his profits by so doing. An unencumbered owner, on the other hand, may not feel this urge to the same degree, hence will likely react differently to a particular price change.

Much has been said and written upon the efficacy of publicity in influencing agricultural production. Just how potent a force it is, is hard to measure because of the large number of other factors influencing production. At any rate, the naïve faith of its potency in certain quarters hardly seems justified. No doubt it may be used with considerable effect in the production of a commodity which is confined to a restricted area,

because of peculiar physical conditions. Under such conditions interested agencies can exercise a greater leverage upon producers because there are fewer of them and because competition from outside areas is limited. However, in the production of a commodity like wheat, which is produced over such a wide area and by so many farmers operating under such varied conditions the effect will be much less. Such effect as it may have, however, be it large or small, will influence the elasticity of supply of the particular commodity.

Such effect as tariffs and bounties will have upon production will come about through their effect upon increasing the price of the commodity or in adding to the actual or expected net returns to the producers. The fact that a bounty is more direct and tangible may cause a quicker response in production than a tariff whose effect is more indirect and may be obscured by other factors.

These various factors affecting elasticity of supply take on added significance when attempting to get a quantitative measure of their importance and effect. The quantitative measure of elasticity, termed the coefficient of elasticity, is the ratio of the increase in supply to the previous supply divided by the ratio of the increase in price to the previous price. Thus the coefficient of elasticity of supply at point P^1 in Fig. 1 is $= \frac{XX^1}{OX} \div \frac{AP^1}{PX}$.

The measurement of elasticity of supply is still in the pioneering stage. While economists generally have recognized the existence of the problem they have accorded it scanty treatment. Until recent years such discussions as have been made have been very general in nature and have not gotten much beyond the discussion of hypothetical cases. During the past five years, however, a number of concerted attempts have been made to measure the elasticity of particular commodities. From these and other studies under way we may expect an addition to our present knowledge of elasticity of supply as well as new developments and refinements in technique.

During the World War when the problem of price fixing

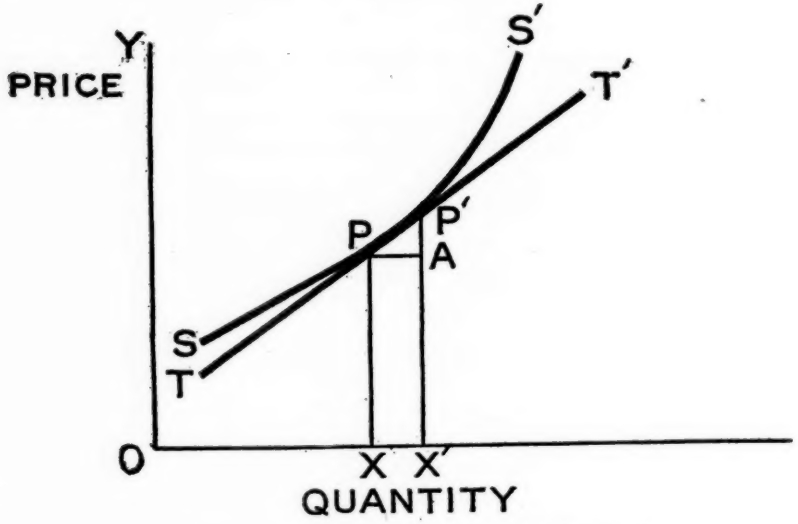


Fig. 1.- Graphic Representation of Elasticity of Supply

was very much to the fore something closely related to elasticity of supply in the long-time sense was discussed under the heading "necessary price," by which was meant the price required to induce producers to bring forth the volume of production alleged to be "necessary." [5] This, however, is by no means a new term. While the "natural price" discussed by Adam Smith and Ricardo is closely akin to it, John Stuart Mill, so far as the writer is aware, first used the term "necessary price." [6] He said, "the cost of production, together with the ordinary profit, may therefore be called the necessary price, or value of all things made by labor and capital;" and in another place—"this necessary value, the minimum with which the producers will be content, is also, if competition is free and active, the maximum which they can expect."

The term since Mill's time has been accorded common usage in economic literature although there by no means has been common agreement as to just what constitutes

[5] Elasticity of Supply of Farm Products by Dr. J. D. Black, Journal of Farm Economics, Volume VI, No. 2, April, 1924.
[6] Principles of Political Economy by John Stuart Mill, Book III, Chapter 3.

"necessary price." But out of these differences in opinion have developed certain proposals for measuring it. A brief review of which will serve as a good starting place for the more detailed discussion later on.

At times it has been contended that necessary price is that price which will just equal the average cost of production. Others have contended that average cost would not do, that it was not high enough, hence they have proposed that a price which would equal the cost of the least efficient producers was the necessary price. Still others have maintained that this was all wrong and that a price which would cover the cost of the group of producers intermediate between these two extremes would be the necessary price. This last idea was termed the "bulk line" or the price which would cover the cost of the bulk of the producers.

There are difficulties with all of those ideas as have been pointed out many times before by different writers. The first two proposals, viz., "average cost" and "cost of least efficient producers" need not detain us long. Obviously a price which just equaled the average cost of production of the total group of producers would be ruled out because it would leave approximately half of the producers above the average producing at a loss and the necessary production would not be forthcoming. A price high enough, on the other hand, to cover the costs of the least efficient producers would bring forth more than the necessary production for the reason that "there is always a considerable volume of production in every industry which is sold at less than cost." In a highly competitive industry like agriculture this is particularly true.

There are also a number of difficulties with the "bulk-line cost" concept. In the first place it is indefinite. No one knows just exactly where it is or whether it would have to cover the costs of 75 per cent, or 90 per cent of the producers or just what percentage it would have to cover. Also, as Dr. Black points out in the article referred to above, an array of one year's costs gives no adequate basis for locating the bulk line. While one year's results may show several producers whose costs average higher than the price,

over a 10-year or 20-year period a true bulk line will not show many producers continuing in production at a loss.

Even assuming that a proper sample could be obtained and that the expense of securing the requisite cost data were not prohibitive, it still would not be possible to generalize respecting the elasticity of supply of the particular commodity from an array of cost figures. This is true for the reason that even assuming the "bulk-line cost" represented the necessary price, the only thing it would show would be that at that particular price a certain volume of production came forth. It would offer no reliable index of what the production would have been had the price been a few cents lower or higher. Yet this is the problem for which a solution is sought.

The further difficulty of translating an accounting cost curve into a supply curve seems to preclude the possibility of cost studies being of much use in solving this problem.[7]

The other approach to the problem which has been made and which gives promise of more fruitful results is the statistical one. The gist of this method is to determine the quantitative relations subsisting between price and supply over a past period of years and then use these observed relations as a basis for estimating future changes in supply. The observed relations, as was indicated above, may relate to changes in price and changes in a supply already in the market place, to the rapidity with which a produced supply flows to market or to a future supply which is yet to be produced and which subsequently will come to market.

On the assumption that human nature doesn't change very much and that producers will react to given situations in the future pretty much as they have in the past rests the foundation for estimating future changes in supply. Whether or not the relations observed in the immediate or distant future will be the same or similar to those observed in the past of course is problematic. All that can be said with definiteness is that for the period covered by the study the mass of producers reacted in this specific way. Until something occurs to make them change presumably they will continue to do so, but there is no def-

[7] Schultz, Henry. Cost of Production, Supply and Demand, and the Tariff. Journal of Farm Economics, April, 1927. (Vol. 9, No. 2) p. 192.

inite assurance that they will do so. New factors may arise which will cause a shift in their response. After a reasonable lapse of time the effect of these new factors may be revealed and the direction and rate of the change caused in the original response be determined. In the meantime, the error due to them will be present in the estimate of supply which is due to specific changes in price. The error may not be so large as it may appear, however, and probably can be reasonably taken care of.

Such a difficulty, for example, arises in estimating future hog supplies on the basis of an analysis made prior to the inauguration of the pig survey. Farmers apparently have been reacting somewhat differently in their hog production to given price situations than they did previous to that time. Such effect as this new factor may have will have to be determined and allowed for before the error due to it can be eliminated.

In the cost method of approach to this problem no allowance is made for the effect of factors other than price upon supply. Nor does it recognize that there is more than one price to which the response is made. In the statistical approach both situations are recognized. In fact, in a problem of this kind in which the resultant is influenced by a large number of independent factors whose control, as under laboratory conditions, is impossible, the technical statistical methods of multiple and partial correlation are the only ones yet devised which give satisfactory results. They make possible the determination of the particular economic relationship desired not on the assumption that all changes are due to it but on the assumption that the changes which are associated with it are due to it and the changes which are associated with other factors are due to them.

The statistical approach further recognizes that the relationships observed will vary not only as between commodities but for the same commodity under different conditions of production and at different levels of price. Thus the relationships may be linear under certain conditions of production and at particular price levels and be curvilinear under others. Unless the analysis covers this and shows the coefficients of

elasticity for the several situations it is incomplete and of questionable value. Multiple linear and curvilinear correlation permit such an analysis and thereby make possible a more realistic determination and measurement of the actualities of a particular situation.

While the statistical approach by measuring relationships ordered in time, makes possible an estimate or forecast of future supplies, it is very difficult to find at what "lags" of price the best estimates of supply may be made. In livestock production, for example, is the response directly related or due to the price at time of breeding, for some period or other preceding breeding or is it to some future price which is expected to prevail when the livestock comes to market? Likewise in crop production do farmers react to the price of the particular crop at time of seeding, or to the price they received for the previous year's crop, or to what they consider the price will be when the crop comes to market?

Studies on cotton show for example, that the price received for the previous year's crop and the price prevailing during the winter period are the dominant factors determining the size of the next crop to be planted. The price of the crop for the second year previous and changes in the price of cost goods such as fertilizer and labor also affect the acreage.

Studies in wheat indicate that both the price at time of seeding as well as the price received for the previous crop are important in determining the acreage seeded. The ratio of the acre value of wheat to the acre value of alternative grains, and climatic conditions at seeding time are also important.

In the hog study referred to above the relationship between corn and hog prices at time of breeding, for a six months' period before and a three months' period after breeding influenced changes in subsequent supply more than any other. Somewhat similar results can probably be expected for other crops and livestock.

In addition to measuring the effect of price and other factors upon acreage and numbers there is the added problem of determining its effect upon yields and upon weight,

production, etc. That is before we can accurately measure the total response in supply we will have to account for changes both on the intensive and extensive margins. This complicates the problem still more and greatly adds to the difficulty of obtaining an accurate measure of elasticity of supply.

Another difficulty, or rather, set of difficulties, in using the statistical approach arises out of the assumption or presumption that a comparison between changes in price and changes in subsequent output reveals the response of producers to the changes in price. Such a comparison is beset with difficulties and subject to a good many qualifications.

In the first place before such a comparison is valid, allowance must be made for secular and seasonal influences. The production of most commodities, particularly those in the nature of necessities, tends to increase at a fairly definite rate from year to year; also in the case of some commodities there is a tendency to change from season to season, being high at certain times and low at others. So in comparing changes in price with changes in production allowance must be made for the effect of these two factors.

Secondly, a comparison between changes in price and changes in subsequent output to be valid must take into consideration the effect of a fluctuating standard of value upon the price of the particular commodity. There is no good reason to assume that there is a very close relationship between changes in the output of a particular commodity and changes in the value of money. So the effect of a fluctuating standard of value upon the particular price must be eliminated.

Thirdly, before it is possible to say that a given percentage change in price results in a certain percentage change in production it will be necessary to isolate the effect of the change in price from the effect of the change in other factors upon output.

Finally, it will be necessary to eliminate the association between actual price changes and producers' expectations of future price changes; also between changes in price of the particular commodity and changes in the price of alter-

native commodities before it can be presumed that a comparison of changes in price with changes in output will measure the elasticity of supply of the commodity in question.

These are obviously very great difficulties and some of them may prove insuperable even with the most refined methods. Yet it is not unlikely that the development and refinements which are now taking place so rapidly in statistical methods will proceed to the point where it soon will be possible to secure more reliable results, even though they fall somewhat short of final solution, than are at present attainable. It would seem a point of wisdom, therefore, in the light of these rapid developments in technical methods, to consider conclusions reached now by this method of analysis as tentative until they can be checked by more refined methods and with the use of better data than are now available.

SOME RECENT CHANGES IN MEAT AND FEED CROP PRODUCTION

L. J. NORTON
UNIVERSITY OF ILLINOIS

One of the most important branches of American agriculture is the production of crops for feeding livestock; corn, hay, oats, barley and the sorghums occupying nearly two-thirds of the crop acreage of the country. These crops are grown more or less in all parts of the nation but the more important centers of production are the corn belt and the area to the north and east, roughly the northeast quarter of the country. Within this vast region there are wide differences in the relative importance of this branch of agriculture, in the particular crops grown as well as differences in the methods of disposal. Three general types of areas may be noted. (1) areas producing feed crops more or less exclusively for sale; (2) areas feeding all the crops grown; (3) areas buying large quantities of feed stuffs usually to supplement home production.

The economic interests of each of these sections differ. The first is interested in high prices for corn, oats, hay or whatever crop is sold; the second is only nominally interested in the price of the crops grown, but intensely interested in the prices received for livestock or livestock products; while the third is interested not only in favorable prices for livestock and livestock products sold but also in low prices for purchased feed. Eastern Illinois, selling corn and oats in volume, is typical of the first; central Indiana, feeding the bulk of their grain, of the second; while the milk-producing sections of New York, New England or Pennsylvania and some livestock feeding sections in the middle west are typical of the third.

The bulk of the feed crops being consumed by livestock largely on the farms where grown, the principal interest of producers of feed crops is in livestock prices. The prices of corn, oats or hay are of little interest while the prices of hogs, milk or cattle are of vital interest. Sections specializing in the production of feed crops for sale, one of the most important of which is central and eastern Illinois, where corn and

oats are largely sold, are vitally interested in feed crop prices. Both the crop and livestock selling farmers are indirectly interested in the prices received by the others. The level at which livestock products can be sold suggests the prices that may be obtained in the long run for feed crops, while feed crop prices reflect the relative abundance or scarcity of crop production and give some idea of the future volume of livestock production.

It is well known that, since the fall of 1920, prices of farm products as a whole have been lower than the general level of prices, taking the years before the war as a standard but among the farm products there have been significant differences in this respect.

The feed crops, corn, oats and hay, have averaged relatively low in price since 1920, while butter, eggs and chickens, products more nearly ready for the final consumer, have been comparatively high in price. The price of hogs, the species of livestock most intimately associated with the feed crops, and in the production of which relatively little labor is involved, has been approximately on the same level as corn. The prices of corn and hogs will always be closely related over a period of years, although not necessarily at any particular time.

Causes of Low Prices for Feed Crops and Related Products

Many causes have been advanced for the unfavorable ratios between prices of certain farm products and farm costs. The problem has two angles: Why are the farm products low? Why are the costs relatively high? Frequently the subject is discussed as though all farm products were equally involved. This is not the case. The farming business is made up of many separate branches, more or less independent, some of which may be prosperous while the others are not.

The following discussion deals only with the factors influencing the low prices obtained for the feed crops and the most closely related meat animals, particularly hogs.

Some of the suggested causes for low prices for farm products as a group are the following:

(1) The stability of farm production and the inability of farmers to make speedy adjustments to unfavorable price relationships.

(2) An inevitable consequence of a decline in the general price level, such as occurred in 1920-21 is that the prices of the basic farm products, particularly the raw materials, are relatively low. That such would be the case for a short period is generally recognized but that this factor would cause a long period of low prices does not appear to be generally accepted.

(3) A continuation of a high wage level would tend to cause relatively low level for the prices of farm products because of the increased costs of conversion and marketing, which are largely made up of payments for labor. Such a wage level might be the result of a number of causes, the tendency for wages to lag behind changes in general price level, restriction of immigration and other protective measures, increased efficiency in many lines of production and the bargaining power of organized labor. The level of money wages has been relatively higher than the prices of commodities during the period under consideration.

(4) The demand has declined for farm products. Sometimes an emphasis is placed upon decline in foreign demand; at other times in the home market demand.

(5) The production of farm products has been expanded. This is also discussed from two points of view. First, that as a result of favorable prices before and during the war farming was over-developed. Second, improved methods of production have cheapened costs, with the result that production has been permanently expanded.

The estimates of the United States Department of Agriculture indicate that increased production of feed crops during and since the war has been due to increases in hay and oats rather than in corn, except from 1920-23.

Only from 1920-23 has the corn crop averaged significantly larger than before the war and from 1924-26 it averaged nearly 100 million bushels less.

On the other hand oats production exceeded the average of the 1909-13 crops during each of these periods: by 20 per cent from 1914-19, 11 per cent from 1920-23, and 24 per cent from 1924-26. Tame hay has also exceeded the 1909-13 production: by 22 per cent from 1914-19; 33 per cent from 1920-23, and 34 per cent from 1924-26. Pro-

duction of wild hay, harvested on land of low value along the edge of the farming country in the west, was 20 per cent larger in 1914-19 than 1909-13, only 7 per cent larger in 1920-23 and 20 per cent less in 1924-26. Barley production has been irregular. Cottonseed decreased from 1909-13 to 1920-23 but in 1924-26 the crop was 22 per cent larger than before the war.

The increase in corn production during 1920-23 was not due to the planting of more acres but to a series of larger yields per acre. The acreage actually declined and still further declined after 1923, being nearly 5 million less in 1926 than in 1909-13.

In the case of oats, unlike that of corn, the increase in production was due to an increase in harvested area of about 5 million acres. This area has continued to increase so that in 1926 it was 7 million acres larger than before the war. Apparently in spite of low price for oats there has been a permanent expansion in its production of between 10 and 15 per cent. Two explanations may be offered for this: The crop requires but little labor and is largely fed on the farms where grown, and most farmers are interested not in the market price of oats but in the price of the livestock in the production of which oats are used. In spite of large yields per acre in 1924 and 1925 there is no evidence to suggest that yields per acre have increased.

The area devoted to tame hay has increased about 10 million acres, and apparently the yield per acre has increased. Since 1920 production has averaged about one-third larger than before the war, two-thirds of the increase being due to the increase in acreage and one-third to higher yields. The acreage has fallen off since 1924. The continued growing of increased quantities of hay in spite of low prices may be explained by the same reasons noted under oats: Low labor requirements, use of hay as feed rather than as a market crop, and the introduction of hay into the rotation from the standpoint of soil fertility.

The acreage of wild hay harvested has tended downward since the wartime expansion, but favorable yields per acre during 1920-23 maintained production.

Index numbers of the total and per capita production of the feeding value of the corn, oats, barley and hay crops for the selected periods were:

Period	Total	Per person in United States
1909-13	100.0	100.0
1914-19	109.9	101.5
1920-23	116.3	100.8
1924-26	109.5	94.9
1926	104.8	87.0

In spite of a corn crop which from 1920-23 averaged 10 per cent above the 1909-13 average, and in spite of an expanded hay and oats acreage and increased yields of hay per acre, production per capita of these important feed crops from 1920-23, was not substantially larger than before the war. Increasing population and smaller corn crops reduced the per capita production from 1924-26, well below the pre-war average.

Expanded production is not sufficient explanation of the low prices obtained for feed crops since 1921.

Production of Meat:—Index numbers of the total and per capita production of meat computed from the data of the U. S. Department of Agriculture are:

	Index of meat and lard production	Index of per capita production
1910-14	100.0	100.0
1915-20	109.9	101.6
1921-24	125.6	108.7
1925-26	126.1	104.5

The peak of meat production did not come during or immediately after the war but in 1923 and 1924. From 1918-20 meat production averaged only 13 per cent above 1910-14, while from 1921-26 it has averaged about 25 per cent larger. When reduced to a per capita basis, it appears that the production per person from 1921-24 was about 9 per cent larger than before the war. During the peake years, 1923 and 1924, the production per person averaged 15 per cent larger than before the war, but by 1926, this had been reduced to 5 per cent above pre-war.

Increase took place in beef, pork and veal, but not in lamb

and mutton. Production in 1925-26 were the following percentages of production in 1910-14; pork, 129 per cent; lard, 141 per cent; beef, 120 per cent; veal, 167 per cent; lamb and mutton, 87 per cent. This represented an increase from 1921-24 in the case of beef but a decline for pork and lard.

Such increase in meat production indicates an abundance of meat which would be reflected in lower prices paid by consumers for meat, lower prices to producers for live animals and lower prices for the feed crops used in their production. The lowest prices for hogs came in 1923 and 1924, when supplies were largest, and since 1924 prices have improved. With the relatively high level of wages and other marketing costs, abundance of a consumer's good such as meat resulting in low prices to consumers tends toward relatively lower price to the producer for the live animals and still lower prices for the feed crops used in their production. The fundamental cause is the abundance resulting in low retail prices but the effect of a high level of conversion and marketing costs tends to lower prices to producers for the raw materials.

This increased meat production resulted in larger domestic consumption of meat and larger exports, compared with prewar. The average estimated consumption of meat and lard was: 1910-1914, 150.7 pounds; 1915-1920, 141.1 pounds; 1921-1924, 156.7 pounds; 1925-1926, 156.7 pounds. Meat production has been relatively larger than feed crop production during the period for 1921-26. The excess meat produced may have been caused by three things: (1) Liquidation of meat animals, i. e., consuming of animals produced in an earlier period; (2) decline in other uses for feed crops; (3) increased efficiency in meat production, i. e., improved animals, feeding methods, or care, which made possible more meat per pound of grain or hay.

Liquidation

Our only information relative to year-to-year changes in numbers of livestock in the United States are the Department of Agriculture estimates.

Beef. According to these estimates, from January 1, 1921, to January 1, 1925, the number of cattle declined 5.2 million or about 1.3 million head per year, the de-

crease taking place chiefly in 1923 and 1924. Allowing 500 pounds of beef per animal, the annual production of beef would be increased about 650 million pounds from this source. This accounts for all of the increase in beef production during 1921-24 as compared to 1910-14. Between January, 1925, and January, 1927, the number of cattle declined by 4.5 million head or 2.25 million per year which would account for 1,125 million pounds of beef or practically all the amount by which 1925-26 production exceeded 1910-14.

This suggests that increased production of beef from 1921-26, as compared to 1910-14, was due very largely to the reduction in number of cattle from 67.3 million on January 1, 1922, to 57.5 million January 1, 1927.

Hogs. The reduction in numbers of hogs has not been marked. Between January 1, 1921, and 1925, hogs were reduced by about 3 million head or 750 thousand per year, the equivalent of about 150 million pounds of pork out of a total animal increase of over 3 billion pounds. Pork production was maintained at the 1923 level during 1924, by reduction in the number of hogs of about 10 million head. Between January 1925, and January, 1927, the decline was 3 million head, equivalent to 300 million pounds of pork annually out of a total increase from 1910-14, of 2,500 million pounds. It will be seen from this that liquidation in number of hogs influenced the average production of pork relatively little from 1921-26 but did influence the annual variations in production.

Decline in Other Uses for Feed Crops

The principal uses for feed crops other than production of meat and other animal products are: For feed for work animals, for raw materials for various domestic industries and for export. None of these have been as important in recent years as during 1910-14. There are fewer horses, less corn is being used as a food and in the manufacture of alcohol and since 1924 exports have been smaller. All of these changes make more grain available for production of meat and dairy products.

Reduction in number of horses. The introduction of the gas engine as a source of power has reduced the number of horses needed in cities and on farms. The Census Bureau

reports that between 1910 and 1920 the number of horses and mules not on farms decreased from 3.45 millions to 2.08 millions, a decline of 1.4 million. No official data are available since that date. M. F. Thurston, of Cornell University, states that on the basis of information from 19 cities the number declined about one-third from 1920 to 1926 and was continuing to decline at the rate of 4 per cent of the 1920 number annually. On that basis the approximate number in 1926 would be 1.4 millions and the annual rate of decline about 80 thousand a year.

Up until January 1, 1919, the government estimates indicate that horses and mules were increasing. Since then there has been a decline of between 5 and 6 million head. The approximate number of horses and mules on farms and in cities for selected periods has been as follows:

1910-14	28 millions	1925-26	23.0 millions
1915-20	28.1 "	1927	22.4 "
1921-24	25.2 "		

The quantities of feed consumed by horses on farms varies between sections of the country, and city horses probably are fed more heavily than those used in the country. Only an approximation of the quantities of feed made available by such declines in number of horses can be made. Probably 50 bushels of corn or equivalent grain and 2 tons of hay would be a liberal estimate of a year's feed. This is more hay than horses consume on middle western farms and less than they consume on eastern farms or in cities.

Using these figures simply as a basis for estimate, the decline in number of horses would have released the following quantities of grains and hay for feeding meat and dairy animals. The figures are only approximate.

	Million Bushels	Million Tons
1921-24	190 corn or equivalent	7.6 hay
1925-26	250 " " "	10.0 "
1927	275 " " "	11.0 "

The larger part of this grain was oats. The difficulties involved in reducing the quantities of oats marketed to conform to this new situation and in finding other uses for the

oats has created a more serious price problem in oats than in the other feed grains.

Reduced numbers of horses have become of increasing importance as an explanation of increased meat production. From 1921-24 the grain released was equivalent to about two-thirds of the increased corn crops, and the hay released corresponded to one-third of the increased hay production, as compared to 1909-13; while from 1925-26 the hay released was equivalent to half of the increased hay production and the grain released was several times larger than the increase in grain production. Since the short corn crop of 1924, the decline in number of horses has been the most important single cause of increased per capita production of meat.

The number of horses in this country declined about 750 thousand a year from 1921 to 1926. The hay and grain so released if converted into meat would more than supply the meat requirements of our annual increase in population. Our population is increasing at the annual rate of something less than 1.5 million per year. The average annual consumption of meat and lard is about 160 pounds per person. The total meat requirements to provide for this increase would be 240 million pounds. The hay and grain fed to a horse is equivalent to about 75 bushels of corn. Assuming that this, when converted into meat of various kinds will average 6 pounds of meat per bushel or 450 pounds from the hay and grain consumed per horse, a decline of 750,000 in number of horses would release feed equivalent to 337 million pounds of meat or more than sufficient to provide for the annual increase in population.

This rate of decline in number of horses cannot go on indefinitely and is apparently slowing down at the present time.

Decline in other uses for feed grains. There have apparently been significant declines in the quantity of corn used for human consumption, the quantities of corn and other grains used for the manufacture of alcohol and the quantity of corn exported. The quantities of corn used for certain purposes average as follows, in millions of bushels:

Ground in starch and glucose factories[1]		Used by licensed distilleries year ending June 30[2]		Ground in merchant mills[3]	
1913-14	48.0	1910-14	22.4	1909	209.3
1915-20	63.0	1915-20	16.7	1914	180.1
1921-24	66.7	1921-24	3.9	1919	113.8
1925-26	73.3	1925-26	7.6	1921-23	123.7
				1925	100.3

Exports including meal year beginning July 1[4]	
1909-13	40.2
1914-19	61.0
1920-23	91.3
1924-26	17.3

[1] Current Summary of Business Conditions.
[2] Annual Report U. S. Commissioner of Internal Revenue.
[3] U. S. Census of Manufacturers.
[4] U. S. D. A. Year Books. There is some duplication in declines in corn meal grindings and exports of corn and meal.

Of the four uses for corn noted here, only the starch and glucose factories are consuming larger quantities of corn than in 1910-14. During the years prior to 1924, when corn crops were large, the increased exports and larger grindings by starch factories offset the declines in quantities used for alcohol and corn meal. But during 1925-26 exports have fallen off and quantity used by corn meal mills, in 1925 at least, was further reduced. The result is a net decline of 108 million bushels in the quantity of corn used in these four ways. The decline of corn meal production in 1925 may have been due to high prices for corn because of the small crop in 1924.

The net declines in quantity of corn used in these four ways appears to be at least 100 million bushels and adds about 40 per cent as much to the grain available for producing meat and milk as the decline in number of horses.

This overstates the case somewhat as by-products were produced both in the manufacture of corn meal and alcohol which were used for feeding livestock. As a partial offset to this the corn products industry, which is using increasing quantities of corn, yields by-products used for feeding.

Causes for these changes in corn consumption. The corn products industries, producing starch, corn sugar, gluten, etc., have been expanding. In recent years the largest increase has been in the manufacture of corn sugar, the

markets for which appear to be growing, and for which improved processes of production have recently been developed.

Exports increased from 1921-24 under the stimulus of low prices, particularly in 1921 and 1922, but were greatly diminished in 1925 and 1926. Argentina apparently can supply the export trade in corn to better advantage than the United States and consequently we have sold but little since 1924.

The reason for the decline in consumption by distilleries that would first occur to one is the prohibition amendment. It appears, however, that there has been a replacement of corn by a cheaper raw material, molasses, rather than a decline in the production of alcohol. The quantities of raw material used in the production of alcohol by licensed distillers were (000 omitted):

	Year ending June 30 1913[1]	Year ending June 30 1925[1]	June 30 1926[1]
Malt (bushels)	4,253	1,056	641
Wheat "	3	----	----
Rye "	5,828	97	13
Barley "	1	----	----
Corn "	23,848	7,201	7,948
Oats "	8	----	----
Molasses (gallons)	64,641	203,270	267,404
Liquids containing over ½ % alcohol (gallons)	----	37,824	44,508
Raisins (pounds)	----	96,171	10,705
Sugar, Starch, etc. (pounds)	----	8,107	33,141
Rice (bushels)	----	----	724

[1]Annual Reports of the Collector of Internal Revenue.

The quantity of corn used in 1913 amounted to a little less than 1 per cent of the production of corn at that time. Small quantities of barley (malt) and rye were also used.

During 1925 the quantity of molasses used was threefold larger than in 1913 while the quantity of corn had declined to one-third of the quantity formerly used. This quantity of molasses is apparently equivalent to about 40 million bushels of corn. The use of nearly 100 million pounds of raisins in 1925 is of interest, but it will be noted that the quantity used declined the following year. For the grade of

alcohol now being made raw materials cheaper than corn are apparently available.

The most serious decline in these commercial uses of corn is the decrease in grindings by corn-meal factories. These factories used 60 million bushels less corn in 1921-23 than in 1909-14 and nearly 100 million bushels less in 1925. In addition, grindings of corn in custom mills decreased from 35.2 million bushels in 1909 to 23.7 in 1919. These averages are based on Census data and do not include home grinding in small farm mills which may or may not have increased since 1909. Enumeration since 1919 has been made by mail instead of personal interview, as was the case in earlier years, and this may account for a part of the diminished figures.

The growth of the baking industry and the decline in home baking, and the decreases in rural population have contributed to the diminished use of corn meal.

The smaller quantities of corn used in these ways not only adds to the quantity of feed available for meat and milk production but tends to depress the market price of corn, just as reduction in the number of horses has been a large factor in depressing the cash price of oats. The sections of the country supplying cash corn and oats continue to sell corn and oats in quantities which at times accumulate in market centers, thereby tending to depress the price.

Changes in Use of Oats and Barley. The chief declines in use of other grain are in oats for horse feed, and barley for brewing. The significance of decline in number of horses has previously been discussed.

The following quantities of grain were reported to have been used for brewing in the United States for the year ending June 30, 1916: [1]

Barley	52,439,973
Corn	15,711,515
Rice	2,354,000
Total	70,505,488

[1] Yearbook, U. S. Brewers' Assn. 1917: 171. It is stated that these data were obtained through the U. S. Department of Agriculture and Collector of Internal Revenue.

This was about 30 per cent of the barley crop and one-half of 1 per cent of the corn crop. During 1915-16 the production of beer was about 8 per cent less than from 1910-14. The brewing industry from 1910-1914 apparently used annually grain equivalent to about 66 million bushels of corn.

Since 1918, the quantities of material used in the legal production of fermented liquors have been published in the Reports of the Collector of Internal Revenue. For the five years beginning July 1, 1921, about 170 million pounds of malt and 23 million pounds of corn and corn products were used. This is equivalent to about 6 million bushels of corn. This suggests that the equivalent of 60 million bushels of corn, chiefly barley, has been released from the brewing industry for feeding purposes. This overstates the case because the brewer's grain and malt sprouts which were by-products of the brewing industry returned perhaps one-third of the original feed value of the barley and other grains as feeds.

The quantities of grain released by prohibition both of distilled and fermented liquors are apparently much less than the quantity released by reduction in numbers of horses and somewhat less than that released by reduced consumption of corn as a food.

To offset these declines there has been some increase in the exports of both barley and oats, though the amount of oats so disposed of is small when compared to total crop. The averages follow:

Exports for year beginning July 1	Millions of Bushels	
	Oats	Barley
1909-13	9.7	7.9
1914-19	95.4	24.5
1920-23	16.2	18.1
1924-25	28.2	25.4

Increase in Efficiency of Production

It has been suggested that more meat is being made per pound of grain and hay and this has been a factor of importance in the larger production of meat. Adoption of better methods of breeding, care and feeding may be having this

effect but no such explanation is necessary for the increased output of meat since 1921. The grain made available by increased production and reduction in the amounts used for horse feed and commercial uses, as described, would have easily produced this meat without assuming increased efficiency.

A series of high corn yields, increased acreages of corn and oats and a series of good hay yields resulted in increased production of feed crops from 1919 to 1923, but when reduced to a per capita basis the feeding value of the corn, oats, barley and hay crops averaged but little above pre-war during 1920-23, and considerably below pre-war during 1924-26.

Meat production per capita was nearly 10 per cent above 1910-14, between 1921 and 1924, but only 5 per cent above in 1925 and 1926.

Output of meat was relatively larger than production of feed crops because of reduced numbers of horses, liquidation in cattle herds, diminished use of feed grains in the manufacture of corn meal, distilled and fermented liquors and smaller exports of corn.

Such a combination of circumstances tending to create a surplus of feed grains, even though there was no expansion in production per person, is remarkable and has much to do with the low prices for meat animals and feed crops during the period under consideration.

Factors tending to bring to an end such surplus meat production include the following:

(1) The end of liquidation in the cattle industry has probably been reached. Higher cattle prices suggest this. When it becomes necessary to make our entire supply of beef out of current crops and pasture, large quantities of hay and grain will be absorbed. The rebuilding of reduced cattle herds will also utilize feed that will not show up in the market for some time in the future. If liquidation in cattle herds has been as important a factor in increasing meat production as suggested above, amounting to perhaps a billion pounds of meat annually in 1925 and 1926, its end would reduce the per capita production of all kinds of meat to about the 1910-14 level, other factors remaining as they have during the last two years.

(2) The tendency to reduce the numbers of horses will come to an end eventually. The rate of decline at present appears slower than formerly. The continued release of feed will then come to an end. Enough colts have not been raised in recent years to maintain present numbers of horses and, if an increase takes place in the number raised, this will absorb grain and hay which in recent years might have been used as food or in the production of food.

(3) Further significant declines in exports of corn or use by manufacturers of distilled or fermented liquors seem impossible, the quantities now used being so small. On the other hand, the steady growth of the industrial uses, such as butyl alcohol, may expand the outlet.

(4) The continuous increase in population.

(5) The apparent tendency toward little or no expansion in acreage of feed crops and toward little or no increase in yield per acre.

On the other hand the corn crops are not likely during the next few years to average as small as during the last three years. This may not be true any particular year because of unfavorable weather. Improvements in the efficiency of converting grain into meat cannot be ignored though it is easy to overestimate the importance of this factor on the basis of the showing of individual farmers.

Barring the influence of a series of favorable crop yields, which is not impossible, the trend of meat production per capita for the next few years will probably be downward and this will tend to gradually strengthen the prices of the feed crops and meat animals most closely related to them. A series of short crops would hasten this process; a series of large crops will delay it.

THE EXPERIENCE OF KANSAS WITH WHEAT POOLS

JOSEPH G. KNAPP
INSTITUTE OF ECONOMICS

I. POOL BEGINNINGS IN KANSAS

The first attempt at wheat pooling in the Southwest occurred in 1919 before the collapse in wheat prices in 1920. Growers argued that the cost of living had increased so rapidly that the price then received represented less in purchasing power than had "dollar wheat" before the war. These circumstances gave birth to the "card system" of wheat pooling, which attempted to keep growers from selling wheat at the prevailing prices. Scores of farmers circulated the cards "which, when signed, pledged the grower to hold his wheat with his neighbors" until they had spread throughout the entire Wheat Belt. Abe Slaughter of Manchester, Oklahoma was the originator of the "card system" idea. Each signer paid a $1.50 membership fee for use in furthering the movement.[1]

The "card system" was so well received that growers met together in Hutchinson, Kansas, on May 18, 1920, to discuss the formation of a more stable organization. At this meeting the National Wheat Growers' Association was launched. Its principal feature was an agreement among its membership, which, in effect, was intended to withhold wheat from the markets until a price of $3.13, fixed as fair by a price-fixing committee, was reached.[2] Although perhaps exaggerated, the total membership of The National Wheat Growers' Association as reported by the secretary-treasurer on August 1, 1920, was "50,000 members qualified under the constitution in the states of Texas, Oklahoma, Kansas, and in the southern counties of Nebraska." [3]

In order to bind the membership to this policy a marketing contract was devised which bound the members to market their

[1] Mr. W. H. McGreevy, of Carmen, Oklahoma, served as National secretary-treasurer.

[2] Mr. McGreevy in a letter to the writer, December 22, 1925, states that The National Wheat Growers' Association was organized "not to withhold; Price-Fixing Committee *only* recommended estimated minimum price should be $3.13 per bushel to cover cost and profit at that time." The official name of The National was seldom used—"The Wheat Growers' Association of the United States of America."

[3] Stated in a communication to the membership, August, 1920.

1920 wheat crop in accordance with plans specified by a subsidiary sales organization—the National Sales Commission—at the price fixed by the Price-Fixing Committee. This contract was not to bind the growers "until 51 per cent of the wheat unsold in the states of Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, and Minnesota has been contracted for sale to said agency."[4] The marketing program of the National Sales Commission provided that local associations at shipping points would select the sales agent for that point, and that each local association was to be governed by rules and regulations adopted from time to time by the National Sales Commission. A fee of $2.50, to cover the expense of organizing the commission, was assessed each contract signer. Although many of these contracts were signed during the crop year of 1920, before the rapid price decline occurred, they failed to enlist the general support of the National membership and so were discarded as impracticable.

When the high prices for wheat broke in November and December, 1920, although some of the members held for the fixed price of $3.13, most of them sold, accepting the low prices as an inevitable consequence of the reduced demand in Europe and the large supply of wheat in the United States and other producing areas.[5]

In June, 1921, the National Wheat Growers' Association again met in national convention at Hutchinson, Kansas. At this meeting the members re-dedicated themselves to furthering a pool method of marketing, regardless of the unfortunate fact that prices had fallen notwithstanding their activities. The enthusiastic address of Aaron Sapiro, who recounted the success of California co-operative marketing associations, was largely responsible for this vote of confidence.

The association set a membership goal which would, if successful, place 250,000,000 bushels under contract by 1922, the quota for Kansas being fixed at 51,000,000 bushels. A considerable alteration was made in the organization. The growers in the component states were to organize

[4] *Instructions to County and Local Secretaries of The National Wheat Growers' Association*, issued by W. H. McGreevy, National secretary-treasurer.

[5] The National Wheat Growers' Association had reasoned as early as July, 1920, that there was danger of overproduction, but they did not expect it to have an effect before the movement of the 1921 crop. Members were then advised to reduce plantings for 1921 by 20,000,000 acres, or nearly 30 per cent of the acreage then in wheat.

into state wheat growers' associations, which were to market their own wheat according to pooling contracts prepared by the National Wheat Growers' Association.[6] These pooling contracts called for delivery of wheat to the associations as called for, vested title in the association so that it could finance itself, provided for liquidated damages for non-performance of contract, contracted to sell the product to the best advantage over a period of twelve months, and were to prorate the proceeds on the basis of average prices received for like quality over the period of the pool, less cost of operation and a small amount set aside for revolving fund and reserve.[7]

Support of the revised plan was at first disappointing, for, of the 51,000,000-bushel goal set for the Kansas Wheat Growers' Association, only 5,000,000 bushels were signed by marketing contracts, while in other states an even smaller proportion of the quotas were signed. Failure of the association plan to gain support was partially due to the friction then prevalent in the wheat states between the United States Grain Growers, Inc., and the National Wheat Growers' Association. The marketing plan of the United States Grain Growers, Inc., was fundamentally opposed to a strictly pooling contract. This organization, which had been incorporated on April 16, 1921, proposed a plan which gave the grower an option between a pooling plan and one which amounted to selling through a national federation of country elevators.[8] Mr. C. H. Gustafson, president of the United States Grain Growers, Inc., led the fight for the plan of his organization, while Mr. Aaron Sapiro became the acknowledged leader of the faction which demanded a 100 per cent pooling plan. The rivalry of the two plans thus injured the chances of success for either.

Since the National Association had stipulated that the new arrangement would not go into effect until the quotas

[6] Aaron Sapiro, as legal advisor of The National Wheat Growers' Association, drafted the contract, which became known as the Sapiro contract. It had been adopted by The National directors on February 11, 1921, at a meeting called in Chicago. The membership fee was increased to $10, which gave the grower membership both in the state association and in the national association.

[7] As summarized by Mr. Ralph Snyder, president of the Kansas State Farm Bureau, in a letter to writer of October 8, 1925.

[8] See p. 8 of pamphlet issued by U. S. Grain Growers, Inc., entitled "Grain Marketing Plan of Committee of Seventeen" for a full description of the plan.

were signed, the Kansas organization committee "passed a resolution to have an amendment written to the contract providing for incorporation with 5,000,000 bushels of wheat. Signing of the amendment was not completed until September 15, 1921." [9]

The chaos which enveloped the future of the National Wheat Growers' Association was at this time cleared by the birth of the American Wheat Growers' Association in February, 1922.[10] The new organization united the leaders of the National with the leaders of the wheat pooling associations of the Northwest. For example, Mr. W. H. McGreevy, secretary of the National, became secretary of the American, and Mr. George Jewett, who had been the active head of the Northwest Wheat Growers Associated, became the manager of the American.

According to the "American" plan, state associations with like marketing interests were to form regional, or zone, marketing associations while the American itself would operate as an overhead organization. The Kansas association, however, remained outside of the American and also outside of the Southwest Wheat Growers Associated, which had been formed by the state associations of Oklahoma and Texas, preferring to control its own marketing arrangements.

II. The Critical Period

A certain part of United States history is known as the "critical period." It covers that time preceding the ratification of the United States Constitution when it was a grave question whether the states would succeed in their attempt to build an

[9] Statement of C. E. Cox, president of The Kansas Co-operative Wheat Marketing Association, *Wheat Growers Journal*, January 5, 1926, p. 6.

[10] Judge L. Gough, president of the Texas Wheat Growers' Association, in a letter to the writer of November 14, 1925, describes the formation of the American as follows. "In June, 1921, I attended the meeting of the National Association at Hutchinson, Kansas, and was elected vice president. * * * In February there was a meeting held in Denver, at which time the name American Wheat Growers' Association was adopted. There was another meeting held in Wichita, Kansas, some time later, when there was a committee appointed consisting of George Jewett, George Duis, and W. H. McGreevy to draft a plan for the forming of the American Wheat Growers' Association." The American Wheat Growers Associated, Inc., was formed in May, 1923, according to Mr. W. H. McGreevy, who served as the first secretary of the organization. (Letter of December 22, 1925.) The peak of the American's activity was reached in the fall of 1923, when it had state units in Washington, Oregon, Idaho, Montana, North Dakota, South Dakota, Minnesota, Nebraska, and Colorado. Gradually individual state associations have assumed control of their own marketing problems until now the American is serving only as the sales agent for the South Dakota association.

independent government. A somewhat analogous period is found in the history of wheat pooling in Kansas during the next few years, as it was continuously problematical whether the pools would succeed.

Bitter rivalry existed in 1921 between the proponents of the pool marketing plan and the followers of the marketing plan of the United States Grain Growers, Inc., in Kansas. As pointed out above, the two plans were fundamentally opposed to each other. The pooling plan as sponsored by the Kansas Wheat Growers' Association removed all of the individual growers' marketing jurisdiction and placed it in the hands of his state association under the control of his board of directors, elected from the membership of the association. The United States Grain Growers, Inc., plan gave the grower the option either of pooling in common or of selling through local elevators joined together in a national sales organization.[11] The first plan was based upon absolute control of the time and method of marketing the commodity by the association; the second left the time and method of marketing optional with the producers.

A further complication which hindered the pooling association in gaining converts was the presence of about 600 co-operative elevators, many of which had been organized by the Farmers' Union or the Equity Union. These elevators were represented by terminal commission companies on the Kansas City market whose officials maintained that the best marketing method for wheat was through farmers' elevators which sold through their own terminal commission companies. The Farmers' Union Jobbing Association represented the Farmers' Union while the Equity Union Jobbing Association represented the Equity Union. They claimed that terminal commission companies got the market price for wheat, that the profits were pro-rated back to the local co-operative elevators in proportion to the stock they had invested in the terminal companies, and that thus the growers secured their full share of the return from grain wherever patronage dividends were paid by the local co-operative elevator. Many of these co-operative

[11] The plan of the United States Grain Growers, Inc., did not provide any means for pooling except in local units. The farmers around a certain local shipping point could form a local pool and sell their wheat in that way or sell it through local elevators in the regular way. There was no provision for a state pool or any large pool. This pooling arrangement was a bid for the support of the pooling advocates who had wanted a "33⅓ per cent compulsory pool" whereby one-third of each grower's crop would be contributed to the pool.

elevators held memberships in the Farmers' Co-operative Grain Dealers Association of Kansas, which organization favored the regular forms of grain marketing instead of the hybrid plan of the United States Grain Growers, Inc., or the pool.

In January, 1922, the secretary of the Kansas State Board of Agriculture, Mr. J. C. Mohler, called a meeting in Topeka in an endeavor to combine the factions supporting the different marketing plans. This "get-together" conference, as it was called, was well attended by representatives of the various organizations in the state.

The name "get-together" proved somewhat of a misnomer, however, as no constructive plan of getting together gained support, since each of the factions represented had come to the conference interested in sponsoring its own particular plan. The farm bureau representatives were intent on securing the endorsement of the United States Grain Growers, Inc., plan; the Kansas Wheat Growers' Association (although not represented directly by delegates) desired to establish a compulsory pool; the Farmers' Union and the Equity Union hoped to encourage further support for their own plan of grower-controlled terminal commission houses. In fact, the most direct outcome of this "get-together" conference was its clear definition of groupings in favor of and against the pool plan of wheat marketing whatever its ultimate influence.[12]

An account of the resolutions suggested will make clear the extent of the differences of the diverse groups. The general resolutions committee of the conference at first reported in favor of a standing committee on co-operative relations "to be composed of one member from each of the farm organizations here represented, chosen by the farm organization itself," which committee would endeavor to work out a successful plan of co-operation and submit it to a future conference to be called by the committee. Mr.

[12] Secretary Mohler believes that the conference served a very valuable purpose in bringing together for the first time the various representatives of the opposing marketing plans. "Our purpose in calling the conference demonstrates something we believed to be a fact—that is, that the rank and file of all of our farm organizations were eager to co-operate in any movement calculated to benefit agriculture, while the leaders of the various organizations, for some unaccountable, though apparent reason, were unable to do so. We believed a demonstration of this kind might bring the leaders together. Unquestionably the meeting had a most favorable influence, as from that time on the leaders manifested a little more interest in co-operating among themselves * * *" Letter to writer of January 12, 1926.

W. H. McGreevy then submitted a minority report for the Kansas Wheat Growers' Association as follows: "Be it resolved that this conference recommend as a co-operative marketing plan for the wheat growers the 100 per cent internal pool principle of marketing." Mr. W. F. Brown, of the Farmers' Co-operative Commission Company of Hutchinson, offered as a substitute for the minority report the resolution: "We recommend the marketing plans of the Farmers' Union and the Equity Union and all other organizations doing business on these plans, and recommend them to all farmers' co-operative organizations as doing business along proper lines, and further recommend the merger of all these companies." This proposal was satisfactory to the Farmers' Co-operative Grain Dealers Association of Kansas. This organization took the position in a bulletin to its membership January 17, 1922, that, "As the majority of those present came with the intent of forcing an endorsement of the United States Grain Growers, it is of course not hard to understand why the resolution recommending the merging of efforts of the Farmers' Union, the Equities, the Grange and the Co-operative Dealers was not passed."

However, these various reports, together with a suggested compromise from the officers of the United States Grain Growers, Inc., were voted down by the conference. The resolution finally adopted recommended the plan of the United States Grain Growers, Inc., as being the broadest and most comprehensive one before the American farmer at that time and suggested that the membership of the National Wheat Growers' Association be transferred to the United States Grain Growers, Inc., without the payment of any additional dues; that their contracts be written to allow them to pool 100 per cent of their grain; and that they be allowed full voting power in the election in March when the new board of directors of the United States Grain Growers, Inc., was to be elected. It recommended further "that the United States Grain Growers, Inc., make a contract with the Farmers' Union Jobbing Association to act as their representative on the Kansas City market." It thus endeavored to unite all of the proposed plans.

The hope of the Kansas State Farm Bureau that the United States Grain Growers, Inc., would gain support never materialized. The Kansas farmers seemed to desire a marketing proposal strikingly opposed to the then existing system, while the plan of the United States Grain Growers, Inc., did not eliminate the use of the direct sale and consignment. With the failure of the Grain Growers' plan to gain national support, the Kansas State Farm Bureau gave its encouragement to the Kansas Wheat Growers' Association.[13]

A new development in the situation occurred in the fall of 1922, when the Farmers' Union came forward with a wheat pooling proposal in competition with the pool plan of the Kansas Wheat Growers' Association. The Farmers' Union plan attempted to provide for the membership of the Farmers' Union a method of pool marketing which differed mostly from the existing plan by its provision for a quarterly pool. It enabled growers, as preferred, to deliver their wheat during any one of the four quarters of the year. Such pools were to be closed within sixty days of the end of the period and final settlement then made. In conjunction with the quarterly pools there was to be a yearly pool for those who preferred the average price for the year rather than that of any single quarter.[14]

The experience of the Farmers' Union pool in handling the 1923 crop proved that this plan had several disadvantages. It did not satisfy the farmers' demand for orderly marketing since the grower's option of when to market was dependent upon his guess as to which quarter would be best and to his ability to finance the carrying of the crop until he should place it in one of the pools. Furthermore, the cost of administering four quarterly pools and one general pool was excessive when compared to the cost of administering but one general pool.

It is not strange, therefore, that after a brief period of experimentation the Farmers' Union looked with favor on an amalgamation of their pool with the established pool of the

[13] The United States Grain Growers, Inc., endeavored to resuscitate itself early in 1923. Mr. Ralph Snyder explains the attitude of the Kansas State Farm Bureau during this period as follows: "The Farm Bureau favored its own child, the United States Grain Growers, as the most practicable and feasible plan as long as there was hope, but never opposed the Wheat Growers." In letter to writer of October 8, 1925.

[14] See *Kansas Union Farmers*, editorial, September 28, 1922.

Kansas Wheat Growers' Association.[15] By November 15, 1923, it had been tentatively agreed through the Executive Committees of the two organizations that they should launch a united organization program under the supervision of the National Wheat Growers' Advisory Committee at some very early date.[16]

An amalgamation of the Farmers' Union and the Kansas Wheat Growers' Association had long been desired, as the Farmers' Union represented an organization with elevator properties, while the Kansas Wheat Growers' Association was a going grain pooling concern with a pool volume in 1923, of approximately 2,500,000 bushels. The two organizations completed the plans for uniting at a joint meeting with the National Wheat Growers' Advisory Committee in Kansas City, November 17, 1923.[17] They decided to adopt a standard marketing agreement prepared by the National Advisory Committee which, with a few minor changes, was the same as the marketing agreement already in use by the Kansas Wheat Growers' Association. It was not to bind the grower until 33 1/3 per cent of the normal Kansas wheat production over the past ten-year period had been signed.[18] The new pooling association, which was to be known as the Kansas Co-operative Wheat Marketing Association, was to begin operations with the 1924 crop.

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[15] A resolution sponsoring the purpose of uniting the two associations was carried November 7, 1923. *Kansas Union Farmer*, November 15, 1923.

[16] The National Wheat Growers' Advisory Committee was an organization set up by wheat pooling interests among the different state associations to foster the idea of wheat pooling. It had headquarters in Chicago. Hon. Frank O. Lowden served as chairman.

[17] Records of Kansas State Farm Bureau. Professor R. M. Green, Kansas State Agricultural College, gives a slightly different record of the reorganization in a letter to the writer dated March 16, 1926. "Our records show that on November 7, 1923, a meeting was held in Kansas City at which a consolidation was effected between the Kansas Wheat Growers' Association and the Farmers Union Wheat Marketing Association. Provision was made for a later meeting at which a marketing agreement was to be adopted. This meeting was held at Kansas City on November 26, 1923. At this meeting provision was made for a later organization meeting at Topeka, Kansas. This meeting was held on December 12, 1923, and an organization committee appointed. It was at this meeting that the organization was perfected which was to make the big drive for signers to the marketing agreement during the week April 14-19, 1924."

[18] The matter of the correct percentage was debated. The Farmers' Union group favored a high percentage to be signed up in order to insure the effectiveness of the plan. The Wheat Growers' Association, having failed in 1922 to secure a quota, viewed another endeavor of the same nature with trepidation. The new contract, as finally adopted, provided in Paragraph 14 that in case the 44,000,000 quota was not secured the member could withdraw, although only in a prescribed manner. "If the signatures of growers covering a production equal to at least one-third the average production during the past ten (10) years shall not have been obtained by May 24, 1924, the organization committee must notify all subscribers; and they shall have the right to cancel their agreement by written notice received by the committee by June 10, 1924."

Great care was taken in preparing for an intensive campaign, which was set for the week of April 14-19, 1924.[19] All of the well-known co-operative leaders, including Aaron Sapiro, were to take part.[20] The organization manager for the "Big Pool," as it was called, was Mr. F. R. Shanks, while Mr. W. C. Lansdon of the Farmers' Union, with Mr. B. E. Corporan of the Wheat Growers' Association, served respectively as chairman and secretary-treasurer of the Executive Committee.[21]

The campaign, regardless of the careful preparations laid for it, proved a failure so far as signing up one-third of the Kansas acreage was concerned. The words of the Kansas Grain Dealers' Association, the most persistent enemy of wheat pooling in Kansas, were almost accurate. "In some of the counties only five to ten town farmers and an occasional banker were in attendance to meet these much advertised speakers. The local organizers had 'beat the bush' a week to ten days in advance of the advertised meetings and had assured the management that all of these speakers would be greeted by a large enthusiastic audience."[22] At the end of the drive for members, which closed May 24, instead of the 44,000,000 bushel quota a possible 15,000,000 bushels had been signed.

At the conclusion of this disappointing drive "the Organization Committee and others interested decided it would be

[19] Mr. Ernest R. Downie, manager of the Kansas Co-operative Wheat Marketing Association, writes that the week of the campaign which ended May 24, 1924, was also a week of special and intense effort. He states that most of the special effort to sign contracts was during the months of April and May, but the preliminary work was started in the months of January, February, and March. Letter to writer of March 9, 1926.

[20] Aaron Sapiro, who is generally acknowledged as the father of the wheat pooling movement, had not always been in hearty accord with the Kansas Wheat Growers' Association, which had shown from the beginning a stubbornness in settling its problems, especially legal problems, without his assistance. Mr. Sapiro considered it necessary that a pool control a large portion of the crop, and he had belittled the small operations of the Kansas association. In May, 1923, in a conference with Mr. Ralph Snyder at Topeka relative to getting the wheat growers together in some marketing plan, Sapiro had favored junking all the existing organizations and building anew. He had contended that none of the state organizations amounted to anything and were only in the way of a real commodity marketing organization. When the plans for the "Big Pool" were being laid, it was thought by many that Sapiro's presence would but serve to inflame the Farmers' Union group, since he had repeatedly attacked the farmers' elevator movement.

[21] Other leaders were Hon. Frank O. Lowden, ex-Governor of Illinois; Dean H. Umberger, head of the Extension Division of Kansas State Agricultural College; State Senator E. E. Frizell; Ralph Snyder, president of the Kansas State Farm Bureau; Governor Jonathan M. Davis; Dr. Bradford A. Knapp, president of Oklahoma A. and M. College; John Tromble, president of the Kansas Farmers' Union; W. C. Lansdon, National lecturer for the Farmers' Union; Walton Peteet, secretary of the National Council of Co-operative Marketing Associations; B. E. Corporan, general manager of the Kansas Wheat Growers' Association; Carl Williams, editor of the *Oklahoma Farmer-Stockman*.

[22] From a circular of the secretary of The Kansas Grain Dealers' Association issued shortly after the campaign.

advisable to incorporate an association under the new name with the members that had been secured in this campaign.[23] This was done and the Farmers' Union pool was dissolved at that time. Practically all of their membership had signed contracts with the new association and the others were released. This was done by mutual agreement of all of their membership."

A question arose concerning the disposition of the Kansas Wheat Growers' Association, which it was necessary to continue "technically, because part of its membership would not sign new contracts and wished to continue their own association." Those Kansas Wheat Growers' Association members who had signed contracts with the Kansas Co-operative Wheat Marketing Association were to be bound by the latter association upon the expiration of the contract in 1926 that they had with the Kansas Wheat Growers' Association. The two associations, although keeping separate corporate identity, were in reality to operate as one organization with the same sales and office force.[24]

It is apparent that the failure of the "Big Pool" in securing its quota and the merging plans necessarily entered into to retain the new members would cause considerable dissatisfaction among those growers who had membership in the Kansas Wheat Growers' Association and who were not entirely satisfied with its management. Led by Mr. Isom Wright, of Great Bend, the disgruntled members organized the Kansas Wheat Growers' Dissolution Association for the purpose of disrupting the Kansas Wheat Growers' Association.[25] They attained sufficient importance to cause the association to call a special meeting for November 6, 1924, at Wichita. After long and heated arguments the supporters of the Kansas Wheat Growers' Association out-

[23] The growers who had signed the new contract had the privilege of withdrawing within a certain interval as the quota of 44,000,000 bushels signed up had not been reached, but few did so.

[24] Letter of Mr. Ernest R. Downie to writer, December 24, 1925.

[25] The Dissolution Association referred only to the Kansas Wheat Growers' Association, not to the Kansas Co-operative Wheat Marketing Association. A letter from Mr. Isom Wright, secretary of the Dissolution Association, to Mr. Ralph Snyder, October 4, 1925, in response to an inquiry, explains the situation. "You say you want to know the truth about the insurrection in the Kansas Co-operative Wheat Marketing Association; well, they haven't got any rebellion. But the Kansas Wheat Growers' Association has got a red-hot one on in earnest. The trouble with the association, it has committed suicide by falling to pieces of its own incompetence and extravagance."

voted the insurgents, and from that time on the opposition from this source has subsided.

Little attention has so far been given to the direct agitation carried on by the Kansas Grain Dealers' Association or by the Farmers' Co-operative Grain Dealers' Association of Kansas in their endeavor to show that the pools were impractical and unwisely managed.

The position of the Kansas Grain Dealers' Association has been officially registered through the statements and circulars of its secretary, Mr. E. J. Smiley, who has alleged that pooling was a losing proposition wherever tried, and that if anything could be done to take away the salaries of the promoters the whole thing would die overnight. At the time of the "Big Pool" campaign Mr. Smiley felt so facetious about the practicability of the pool that he suggested to the members of the Grain Dealers' Association, who are mostly country elevator operators, the following method of "showing up" the pool: "Why not propose to the wheat growers of your section that are not satisfied with the present marketing system that you will enter into a contract to pay them in cash at time of delivery 60 per cent of the cash value of their wheat and will covenant with them to pay them three cents per bushel more than is paid to farmers that have signed the pool contract, and will make the contract for one year only." [26]

Both the Kansas Co-operative Wheat Marketing Association and the Kansas Wheat Growers' Association brought suit for libel against Mr. Smiley in an endeavor to stop his vilifications.[27] In both libel suits the request for damages was set at $10,000. These suits have recently been settled out of court to the satisfaction of both pooling associations. Under the terms of the settlement Mr. Smiley has published an apology for his attacks.[28] His statement regarding the Kansas Wheat Growers' Association follows:

> In our bulletin of September 18, 1924, I published what purported to be a financial statement of the Kansas Wheat Growers Association and also made statements which indicated that there was a large deficit

[26] *Bulletin* No. 116, The Kansas Grain Dealers' Association, May 1, 1924.
[27] The petitions in both suits are printed in The Wheat Growers Journal, the organ of the Kansas Wheat Pooling Association.
[28] Bulletin No. 142, The Kansas Grain Dealers' Association, July 20, 1927.

in the finances of the Kansas Wheat Growers Association and that their business was in a failing condition financially.

At this time I published this financial statement and my other statements aforesaid, I had no personal knowledge of the condition of the Kansas Wheat Growers Association, and have no such knowledge now. The financial statement was not taken from the books of the Association and was given to me by parties not officially connected with the Association. I realize that I did not use sufficient care and that I had no right to attack in this way a legitimate business organization operating under the laws of our state.

I am now advised by those in high position with the Association, in whose word I have confidence, that this financial statement and my other statements aforesaid are incorrect and give an entirely erroneous impression of the financial condition of the Kansas Wheat Growers Association, and I am glad to retract them and to state that they are incorrect.

Furthermore, I do not wish to reflect upon the management of the Association. I have no personal knowledge of anything that would indicate that the management of the Kansas Wheat Growers Association was or is dishonest or incompetent and I wish to retract any statements in my bulletin that would indicate that they are dishonest or incompetent.

I realize that my attack upon the Kansas Wheat Growers Association was unjustified and I take this opportunity to acknowledge my error and extend my apologies.

Mr. Smiley filed a motion asking that he be allowed to go through all of the books and papers of the Kansas Wheat Growers' Association. The same motion was filed in the case brought by the Kansas Co-operative Wheat Marketing Association. The court refused such permission, simply remarking that on the trial of the case he could subpoena the plaintiffs and have them bring their books and papers into Court and then he could use such as were material, but that these papers in that case would be under the jurisdiction of the court and the association would not be compelled to allow him to see anything not material.[29]

Mr. Smiley's published statements suggest that the interests opposed to wheat pooling in Kansas will in the future be less unbridled.

The Farmers Co-operative Grain Dealers' Association was not so militant in its expression as the Kansas Grain Dealers' Association. In its circulars and assertions issued

[29] Information from Mr. T. A. Noftzger, attorney for The Kansas Wheat Growers' Association, letter of April 11, 1927.

about 1923 this organization endeavored to show that pooling was not a satisfactory grain marketing method, and that "the farmers' elevator must be the foundation on which any improvement in the marketing of grain must be based." One exhibit which was widely circulated to establish the unworthiness of the Kansas Wheat Growers' Association pool was a photographed copy of a settlement issued by the pool to Mr. C. W. Cooper on wheat which he sold through the 1922 pool. It was the intent of this exhibit, which purported to show that Mr. Cooper sustained a net loss of more than 20 cents per bushel, to save the Kansas farmers "from being victimized by pool sharks." [30]

Derogation of the pool by the Farmers' Co-operative Grain Dealers Association has continued, although the pool method is now recognized as a rival method for marketing wheat.

Since one observer of the pooling situation in Kansas expressed confidentially the opinion that opposition of the Kansas Co-operative Grain Dealers' Association was "probably more effective but more subtle than the opposition from Smiley's organization," inquiry was made to Mr. Ralph Snyder, president of the Kansas State Farm Bureau, for an unbiased view of the importance of the Kansas Co-operative Grain Dealers' Association as a factor in the opposition to the pooling movement in Kansas, and of whether the opposition from this source has been as important as that of the Kansas Grain Dealers' Association. Mr. Snyder writes: [31]

> It is my candid opinion that this organization has been of more importance in opposing the Kansas wheat pool than has the Kansas Grain Dealers Association. Not that they have been more active, but being a cooperative organization themselves their opposition has carried much more weight than has that of the other association.
>
> Wheat growers in general consider the Kansas Grain Dealers' Association a protege of the Boards of Trade. It is generally thought that those higher up do the thinking for the local grain dealers. This is not supposed to be true of the Cooperative Grain Dealers Association.

[30] The bulletins from which these statements are quoted were published some time during 1923, the first carrying the signature of Mr. J. B. Brown, president, the second of Mr. R. E. Lawrence, secretary. In another statement Mr. Brown declared, "If anything could be done to take away the salaries of those promoters the whole thing would die over night."

[31] Letter of April 23, 1927.

III. Late Developments

During the pool years since the reorganization of 1924 the combined pooling operations of the Kansas Wheat Growers' Association and the Kansas Co-operative Wheat Marketing Association have been for the 1924 pool 6,138,-112 bushels and 2,631,758 bushels for the 1925 pool. The reduced volume in the 1925 pool was due in great measure to the light crop yields of the members during that year. The 1926 pool is entirely under the jurisdiction of the Kansas Co-operative Wheat Marketing Association, as the Kansas Wheat Growers' Association contracts expired with the 1925 pool. The volume of the 1926 pool is estimated by the manager of the association at four or five million bushels.[32]

The business practices of the Kansas pools were altered in 1925, when the Kansas Co-operative Grain Company was incorporated to market the wheat of the Kansas pools. The stock of this corporation was controlled by the pools. It was believed that the commercial practices of pooling could be best administered by the corporate form of organization, while the education and organization features should be left in the hands of the growers' association. The Kansas Co-operative Grain Company was later reorganized as another corporation—the Southwest Co-operative Wheat Growers' Association. The new corporation, which was incorporated in May, 1926, serves as sales agent not only for Kansas, but also for Oklahoma, Colorado, and Nebraska wheat growers' association pooled wheat.[33]

[32] February 5, 1927.

[33] See paper by writer, "How the Hard Winter Wheat Pool Operates," in *The Co-operative Marketing Journal*, March, 1927, pp. 120-124.

OUR SHIFTING AGRICULTURE

W. E. GRIMES
KANSAS STATE AGRICULTURAL COLLEGE

The experience of the man who could not see the forest for the trees has its counterpart in the present-day discussions of the agricultural situation. Also it may work the other way and there may be difficulty in evaluating the forest if an intimate knowledge of the trees composing it is not at hand. The ideal situation would be a knowledge of the extent of the forest and also of the trees that compose it.

In considering the present agricultural situation there is need for a broad general consideration of the agriculture of the country as a whole and also for an equally careful appraisal of the situation in specific regions and localities. Dr. Nourse, in his paper on the outlook for agriculture and those who discussed his paper, gave a fairly comprehensive view of agriculture taken in the aggregate. Some references were made to specific regions and localities but the writer is of the opinion that more attention must be paid to the problems of these smaller units, which taken together constitute the agriculture of the country, before a complete appraisal of the situation is possible and a program for the improvement of the situation is worked out.

The agriculture of the United States is made up of more than six million farm units competing with each other. Any change in the condition of agriculture in the United States will be the sum of changes made on these individual units. Similarly, the present situation is the result of changes, or the lack of changes, on many farms.

There are, unquestionably, many factors external to the individual farm that affect the agricultural situation but the agricultural problem would be materially less complex if each farm made just exactly the adjustments in crop and livestock production needed for it to play its part in adjusting the agriculture of the nation to the changed conditions. The difficulty lies in the fact that it is not always to the economic interest of the individual farmer to make the adjustments that would be in the interest of the agricultural industry of the

nation. When this holds true for whole regions, economic conflict results and the consequence is agricultural distress while these economic forces are slowly but surely working out the process that usually results in the survival of the fittest.

Far too little is known about the ways in which farmers in different regions and even different farmers in the same region respond to changing conditions of demand and of production. However, enough is known to show that all do not respond in the same way to the same changes. A part of this variation in response can be attributed to the unequal way in which improvements affect the production of land of different grades.[1] Illustrations of the fact that all land does not respond in the same way to improvements in production are to be found on every hand. Drought resistant crops are of little or no value in a region of abundant rainfall but in the sub-humid and semi-arid regions of the United States they have made it possible to produce profitably on land that was sub-marginal before their introduction. Other instances of this same phenomenon were named by Dr. Stine in his discussion of Dr. Nourse's paper when he mentioned the effects of hard-surfaced roads, and of the truck and automobile in widening agricultural zones and in bringing land, that has hitherto been inacessible, within easy reach of market.

All of these improvements—and many more could be named —are of greater advantage to the farmers operating certain grades of land than to farmers on other land. In fact, these improvements may be a distinct disadvantage to those farmers so situated that they cannot take advantage of them. For example, improvements in the facilities for transporting fluid milk have been made in recent years which make it possible to transport milk longer distances. This may increase the competition which dairymen close to large cities will have to meet. The economic advantage which they formerly enjoyed because transportation difficulties were a barrier excluding competition, will be lost. For a time, at least, they may be forced to take a lower price if the newer regions can produce under conditions of low cost. One possible result of such a development is the lowering of land values in the regions near

[1] See Appendix III in Dr. Richard T. Ely's Outlines of Land Economics, Volume II, Costs and Income in Land Utilization, for a fuller discussion of this subject.

the cities; and a lowering of land values usually leads to agricultural distress in the region affected.

Movements of this kind were under way during the period following the Civil War. The westward extension of the railways gave the fertile lands of the middle west access to national and world markets. Other improvements, such as the twine binder, also contributed to the movement. Land values in the middle west moved upward while in New England the "abandoned" farm problem developed. Improvements in production affected different regions unequally and the centers of agricultural production shifted westward.

The data available would seem to indicate that since the World War the production of certain crops has continued to shift westward. Dr. O. E. Baker, in a preliminary report on changes in the utilization of land in the United States gives data that are highly suggestive.[2] Dr. Baker states that, "The decrease in acreage of crops between 1919 and 1924 was * * * general in most of the eastern half of the United States and along the Pacific Coast," that "the increase in crop acreage between 1919 and 1924 occurred mostly in the Great Plains region and in southwestern Minnesota," and that "The decrease in pasture land in farms (including idle crop and pasture land) occurred mostly where the crop land increased, that is, in the Great Plains region and southwestern Minnesota." Dr. Baker's data further show that the cotton acreage picked in Georgia and South Carolina decreased from 1919 to 1924 while the acreage in Texas and Oklahoma increased more than enough to offset the reduction in the South Atlantic states.

Similarly, Dr. Baker showed that westward shifts in the production of corn, wheat, and oats were taking place while hay production showed a tendency to increase in the regions where the acreage of other crops was declining.

It would seem, from Dr. Baker's data, that the conclusion is justified that the shift was toward a more intensive type of agriculture in the Great Plains region and in the western portions of the regions lying immediately to the east. Farther

[2] Changes in the Utilization of Land in the United States, 1919-1924. A preliminary report. Bureau of Agricultural Economics, U. S. Department of Agriculture, June, 1926.

east the trend was toward more extensive agriculture. Other data available for specific sections support this conclusion.[3] In the Great Plains region land is being brought under the plow that until the present has been virgin prairie sod.[4] This westward shifting of agricultural production has come in response to improvements in production and to changes in demand that have been particularly advantageous to the Great Plains and bordering regions. Power machinery, tractors, combined harvester-threshers, improved crop varieties, and improved cultural methods have combined to elevate land that was sub-marginal for wheat production well above the margin. Similar forces have influenced cotton production. On the demand side, the increased use of bakers' bread has increased the demand for wheat of high protein content such as is grown on the semi-arid lands of the Great Plains region. There is also increased demand for the short staple cotton of the western regions.

As the Great Plains region has increased its production of cotton and wheat, it has also increased its production of livestock and of feed crops. To some extent this has increased the competition in the production of other farm products such as hogs, cattle, poultry and eggs, grain sorghums, and corn.

Changes in farm population are also an indication of the trend of crop production westward. Data for Kansas are available for 1915, 1922, and 1925. Table I gives the farm population of the entire state and of the eastern, central, and western thirds for these years. The western one-third of the state increased its farm population materially from 1915 to 1922 and continued to increase from 1922 to 1925. The central portion of the state declined in farm population throughout the period but the decline slowed up from 1922 to 1925 while at the same time the rate of decline in eastern Kansas was increasing. While these data are for only a portion of the area, they support the conclusion that the shift of crop production has been westward. Eastern Kansas is within the area that has suffered declines while western Kansas is

[3] See Some Phases of the Hard Winter Wheat Grower's Problem in Readjustment, by W. E. Grimes in the Journal of Farm Economics, April, 1925, Vol. VII, No. 2, pp 196-219.

[4] This is at variance with Dr. Warren's statement that "In arid regions low yielding land is being abandoned." Careful study of available data and personal observation induce the writer to believe that the opposite is true.

within the area that has gained. It is noteworthy that there have been fewer bank failures in proportion to the total number of banks in western Kansas than in central and eastern Kansas. The data available indicate that the general farmers of the Great Plains and bordering regions have not suffered agricultural distress in the same degree as those in regions to the east of them excepting in those areas affected by continued adverse weather conditions.

Table I—Farm Population of Kansas in 1915, 1922, and 1925. (Data computed from reports of Kansas State Board of Agriculture)

Section of Kansas	1915	1922	1925
Eastern one-third	434,137	434,140	427,384
Central one-third	324,737	305,656	304,080
Western one-third	91,996	107,922	110,164
Entire State	850,870	847,718	841,628

This tendency of agricultural production to shift westward is unquestionably an important factor contributing to the present agricultural situation. It is most certainly not the only factor but it is a factor of no little importance. In view of its importance, Dr. Warren's statement that "The present low prices to farmers * * * are due to secondary effects of deflation" seems scarcely adequate. Also, to Dr. Nourse's five "optimistic and constructive elements" might be added a sixth dealing with the shifting of agricultural production. It should be noted, however, that this sixth point is optimistic for only a portion of the agriculture of the country and for the rest it is pessimistic.

These shifts in agriculture have come about as a result of the varying response of individual farmers to changed conditions. The "possible increase in the foreign demand for our agricultural products" suggested by Professor Carver is certainly to be hoped for but it does not follow that the resultant increase in prices of farm products would affect all regions alike. Much of this westward development has taken place under low prices that were forcing land in eastern regions out of use. Higher prices would undoubtedly encourage further expansion in this Great Plains region but it is less certain that the regions that have been reducing their crop acreages would bring them up to the former figure. Further expansion in the Great Plains region would increase the supply

of farm products and tend to reduce prices. Under existing conditions, any tendency for prices to increase will probably tend to encourage this shifting of agricultural regions.

CONCLUSIONS

The westward shifting of centers of agricultural production in response to changing conditions is an important factor in the present agricultural situation. Farmers operating under different conditions have responded in different ways to the changing economic forces affecting their businesses. More careful study of these responses and of the conditions producing them are needed. The writer heartily endorses Professor Black's proposal that "The studies of farm people should be regional and should include a large number of regions in different degrees of economic progress." It would be desirable to go even farther than Professor Black has indicated and work out programs for regions based upon the causes of changes and upon the trends that are under way. Such programs for specific regions will undoubtedly miss the mark at times, but it must be remembered that changes are made by farmers in accordance with their conception of what the program should be. Surely programs based upon the most complete knowledge available should be correct much more frequently than the guesses farmers have been acting upon so frequently in the past. The greater detail in which these programs can be worked out the better. Specific recommendations, of acreages of the various crops and of the numbers of livestock for farms of specified sizes and types, should be worked out and changes in their organization should be made from time to time as changes in conditions seem to justify. This can be done only when definite type of farming areas have, through careful studies, been established. The specific farm organizations suggested will not fit the conditions in all cases but they would be useful in at least two ways. First, those farmers not following them would tend to be on the defensive and a more careful consideration of the organization of the farm business would probably result and this in itself should have beneficial effects. In the second place the suggested organizations would undoubtedly be an improve-

ment for many farms. The fluctuations in total hog production in the United States are of considerable size but the fluctuations in the number of hogs produced by individual farmers are relatively much larger. Similar fluctuations in other enterprises are common. These suggested farm organizations should tend to discourage such wide fluctuations on individual farms. This in itself will help remedy the situation by securing more orderly production.

More complete and more adequate data are needed to work out programs of the type suggested. However, agricultural distress, which is at least in part caused by the shifting of agricultural production, can be effectively relieved only when the problem is thoroughly analyzed and a program based on such an analysis is put into operation. The writer is of the opinion that greatest progress will be made by attacking the problem chiefly from the regional standpoint and from the national standpoint only in so far as regions have similar problems that can be aided by remedies of general application. Any changes secured in the agriculture of the nation will be the sum total of the changes made by individual farmers. Consequently, studies of the responses of individual farmers to changed conditions should be highly enlightening and permit the grouping of them into type of farming areas where responses are similar. Such information combined with more general information of production and demand should furnish the basis for an effective program to relieve agricultural distress.

AGRICULTURE AND THE NATION'S BUSINESS

L. H. BEAN
BUREAU OF AGRICULTURAL ECONOMICS

In recent years considerable attention has been given to the problem of stabilizing the business cycle. Much is hoped from the recent progress in standardization, in a more even distribution of employment in the highly seasonal industries, such as the building, clothing, and canning industries, and in the more adequate organization of the nation's financial and credit institutions. One important element, namely agriculture, has, however, received inadequate consideration, but it will need to be taken into account before stability in general business conditions is ever accomplished. Agriculture, which supplies the raw materials to industries employing at least one-third of all factory wage earners, and upon whose income depends the welfare of many individual industries and enterprises, has of course been much discussed, but the specific ways in which agricultural production contributes to the physical volume of general business, how agricultural prices may affect business activity through their influence on industrial profits and urban living costs, and how farmers' income affects the welfare of specific industries serving the farm market, have not generally been recognized.

The interrelationships between agriculture and industry are so diverse and numerous that many views—some of them misconceptions—are afloat. Agriculture is frequently given an importance in national welfare, depending on the individual viewpoint, which ranges all the way from a dominant factor to one of little influence or significance. The latter view is likely to be held by those whose interests do not bring them directly in contact with farmers, or who see in agriculture a declining element in our population as the country moves on to a greater degree of industrialization. Others, whose interests are intimately associated with the welfare of agricultural communities, are apt to think that the nation's business rises and falls with the ups and downs of the farmer. Among these are to be found country bankers, country editors, manufacturers and distributors of farm implements, machin-

ery, fertilizer, commercial feeds, household goods for the farm home, and the like.

The truth as to the importance of agriculture undoubtedly lies between these two extreme views, but the lack of detailed investigations into the many-sided interrelationships between farm production, prices, and income,[1] on the one hand, and commercial and industrial activity on the other, makes an adequate statement of the truth impossible. Over and understatements and misconceptions are therefore to be expected and guarded against.

One of the common misconceptions is the assertion that general business activity depends on the prices received by farmers, that if prices are adequate, business is likely to be prosperous and if inadequate, business is likely to suffer. Such a generalization entirely hides the fact that low prices and large output, which usually go hand in hand in agriculture, are a temporary benefit to certain industries and their employees, while high prices and low output may be temporary detrimental factors in the welfare of other industries.

The fact is strikingly revealed in a comparison of fluctuations in agricultural prices and in general business activity during the past fifty years, contained in the accompanying chart. The upper section of the chart shows for a period of fifty years the fluctuations in the relative purchasing power of agricultural prices in exchange for nonagricultural goods, these fluctuations or cycles being shown as percentages above and below a long-time average. In the lower section are shown the fluctuations in general business activity for the same fifty years as computed by the Federal Reserve Bank of New York.

Here it is seen at first glance that high and low agricultural prices have at times been associated respectively with business prosperity and depression, but a closer study reveals these more significant facts; there has been a tendency for business

[1] See this Journal (Oct. 1926, Pp. 479-485) for a criticism and rejoinder involving the apparent relationship between the monthly money income of farmers since 1921, and an adjusted index of the total volume of trade. The writer there pointed out, on the basis of the rise in farm income in recent years and of the similarity in the monthly fluctuations of the two series of data "that agricultural income has played an important part in our commercial, financial and industrial activity since the depression of 1920-21."

The present article deals with the apparent relationship between agricultural price cycles and business cycles. Sufficient data are not at present available to determine whether agricultural price cycles represent similar cash income cycles. Obviously they may not be similar in periods when high or low prices are offset respectively by small or large production.

to recover in periods of relatively low agricultural prices and to decline in periods of relatively high agricultural prices. Thus, contrary to common belief, low prices of farm products have been followed by industrial prosperity and high prices have been followed by business depression. This appears to have been true for each of the major changes in agricultural prices and in business activity during the past half century, except one (see periods marked 6).

A plausible explanation of this hitherto unobserved relationship lies in the course of agricultural production, and the subsequent effects of farm production, prices and income on the various lines of commercial and industrial activity. It may be said that generally periods of low agricultural prices are the reflection of large farm output and that periods of high prices reflect reduced output. Now periods of large output and low prices mean larger volumes of business for railroads, commission men, exporters, for manufacturers of food products, textiles, tobacco, and the numerous associated distributing agencies, wholesale and retail. Low agricultural prices, which hurt the farmer, mean low raw material costs and thus better profit margins for certain industries. Low agricultural prices also mean that city consumers of food are apt to have a larger share of their incomes available for purchasing industrial products. Thus large farm output stimulates not only certain financial, transportation and manufacturing activities directly dependent on agriculture, but also other enterprises which serve the former with raw materials, and their employees with consumption goods, such as clothing, furniture, homes, automobiles, and amusements. Other industries which sell most of their products to farmers, such as the fertilizer, farm implement, and commercial feed manufacturers, tend to suffer with the farmer whenever low prices mean low income. When these factors of large production and low prices have given a considerable impetus to business activity, the resulting increase in consumer purchasing power may become a favorable factor in strengthening the prices of certain farm products, particularly livestock and livestock products.

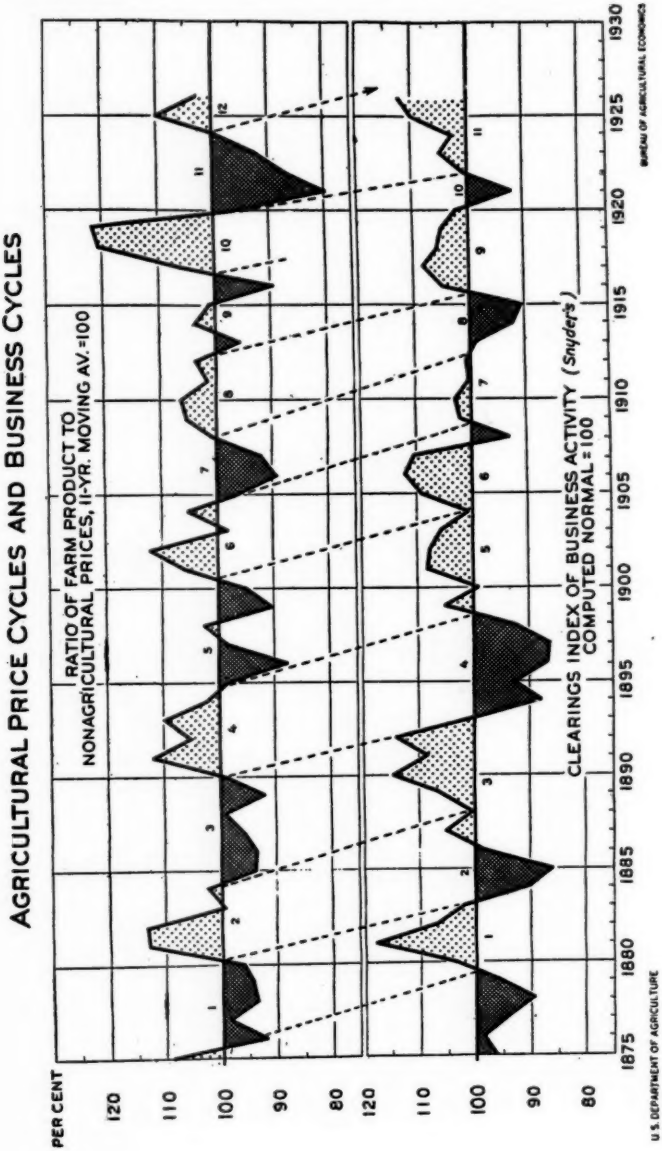
The situation is different in periods of relatively high agricultural prices. Forces are then at work tending to depress general business activity. The smaller output which

has produced the higher prices, reduces the volume of business of all those engaged in transporting, handling, and processing farm products. Employment falls off, and the purchasing power of consumers is diminished. At the same time, higher food prices to consumers in general leave a smaller share of their income available for non-agricultural products and services. And industries whose raw materials are largely or in part the products of agriculture find their profits diminished, while the other industries who serve the farm market prosper with the farmer if the higher prices mean also sustained or increased farm income.

The present cotton situation admirably illustrates how an unfortunately large output at low prices to producers affects industry temporarily both favorably and unfavorably. The low cotton prices, which have reduced the cotton growers' income considerably, have given new life to the textile industry, which is now operating at record activity. A large number of people are being employed in the various stages of transporting, financing, exporting and manufacturing the greatest cotton crop in history, and their sustained or increased consuming power is an element in prolonging the present period of general industrial prosperity. On the other hand, the fertilizer and other industries dependent upon the cotton growers for their market are doing a smaller volume of business than they did a year ago. Such benefits (and losses) are, however, likely to be only temporary, since the inadequate prices paid to the producers tend to restrict their production in succeeding years. The low output and high prices that follow then become unfavorable factors to textile manufacturers and consumers but favorable to industries which sell their wares in the South.

With the agricultural population continuing to decline so that it now constitutes about 25 per cent of the country's total, compared with about 80 per cent a century ago, the question may well be asked whether in the future agriculture will continue to play the role it has in the past; more specifically, whether high agricultural prices will continue to foreshadow business depression, and low prices business prosperity. The continued decline in the agricultural population undoubtedly decreases the farm market as an outlet

for our industrial goods, but this is in part offset by the expansion of our foreign markets. Farm production, however, promises still to continue as a major source of the nation's raw material and food supply, and inasmuch as agricultural production will continue to fluctuate primarily



in response to climatic conditions and in part to high or low prices, general business activity will undoubtedly continue to show corresponding fluctuations.

This fact is not generally taken into account by those who assume that the present period of industrial prosperity heralds the end of the alternating years of prosperity and depression which have characterized the past. A careful study of the ups and downs of business, as depicted in the lower half of the accompanying chart, will indicate the striking similarity between the course of business since 1921 and the two preceding periods, 1885-1890 and 1897-1902. During each of these periods we undoubtedly had optimists who saw the end of business fluctuations and the perpetuation of everlasting prosperity. But agricultural production and income did continue to fluctuate largely as a result of climatic variations, our financial institutions continued to play their particular role in the business cycle, business men continued to respond as they had in the past to prospects of good or inadequate profits, and our foreign trade has also been a variable factor in our national business life. Although the optimistic hopes did not come true, it should be observed that fluctuations in general business activity appear to have diminished somewhat. The swings above and below normal expectations have not in general been as great since 1900 as they were in the preceding years. Incidentally, a similar decrease has also taken place in the fluctuations in the production of major crops.

Stability in agricultural conditions, it is obvious, is an essential part of any program aiming toward stability in the nation's business. From what we have already said, stability in agricultural conditions means different things to different industries. To the interests of some it means stability in farm production, to others, in farm prices, and to still others, in farm income. To farmers themselves, the important problem is how to prevent great variations in production due to weather and uncontrollable factors, variations in domestic business conditions, in costs of production and marketings and in foreign agricultural production and prices, from playing havoc periodically with their income and their standards of living.

THE GROWTH OF ECONOMIC RESEARCH

E. W. ALLEN
OFFICE OF EXPERIMENT STATIONS

Considerable interest has been manifested from time to time in the inauguration of research in agricultural economics, especially as a result of the passage of the Purnell Act. Some anxiety has been expressed as to whether expectations were being fully met and whether the attitude toward this subject was generally favorable. A recent committee report raised "the question as to whether the expenditures conform to the intent of the Act, and to the best interests of agriculture."

The question whether the progress and the outlook for research in this field are matters for apprehension or for encouragement is one of real importance, not only to the welfare of the work itself but to the pride and satisfaction of those directly concerned in it. To answer it evidently requires a quite broad consideration of what has been done, what this has involved, and the movement that has been set in operation. Comparisons with long-established lines of work may not tell the whole story or reflect the thoughtful, interested attention which the subject has received. Research in a new line, and one so essentially different, can not be built up rapidly and wisely. This is especially true in cases where the foundations for it have to be laid; even where it is a matter of expansion there are bound to be some delays. The subject itself, as one for the development of sound research, has had to receive some organization from within, and evidence of groping has not been wholly lacking. So enthusiasm may need to be tempered but not dampened by fundamental considerations which may not in reality indicate any lack of appreciation or of disposition to foster the new lines.

If a layman may venture an opinion, it is one of optimism, for it is felt that agricultural economics has made remarkable growth in the two years since the Purnell Act went into effect. Probably no other department of station investigation ever had anything like as rapid and extensive development. Now that the preparatory stage is passed the situation seems distinctly

encouraging and the outlook increasingly hopeful. This view is not based merely on the number of projects and the funds for their support, but on the scope and the character of the investigation, its spread over the whole country, the increase in working force, and the encouragement given to students to prepare themselves for a career in this field of research.

In every state except one the experiment stations have inaugurated investigations in this subject and made it a part of their program under the Purnell Fund, compared with 29 in 1925. In the spring of that year the station forces in economics numbered 105 persons; the latest figures show 230. This has meant a long stride in advance in the organization and personnel for economic research.

The number of projects in any subject is a quite superficial measure of the growth or status of research—at least an incomplete one. Furthermore, any statement as to the amount of funds devoted to this subject is likely to be misleading, because the statistics on the apportionment of the Purnell Fund among projects are not sufficiently detailed and many projects are receiving supplementary support from other funds.

However, considering the number of projects for what it may be worth, a count made at this writing (the end of May) shows 234 active projects in agricultural economics (not including rural sociology) listed under the Purnell Fund, out of a total of 737 for all subjects. Those in economics are practically all new ones, started since the Purnell Act was inaugurated, while a much larger proportion in production lines were under way before the Purnell Act passed and were assigned some of the new fund to help out in their support. This is worthy of note in making comparisons, for it shows that at the beginning the use of the new fund to help out some of the going investigations was in response to necessity and may be temporary.

In addition to the 234 current economic projects mentioned above, there are a considerable number of closely related ones on such subjects as standards of living, farm income, purchasing power of farmers, economic status of the farm family, contributions from the farm, movement of farm population, and the like, classed under home economics and rural sociology. It

is apparent, therefore, that fully a third of the projects now current under this new appropriation are in agricultural economics and closely related lines. Except for a noticeable tendency to outline large undertakings in this field, often embodying several projects, the total might be considerably greater than it is.

The above relates to the record as it stands at the present time. Fully half a hundred other economic projects have been reported as concluded and dropped from the fund, many of them published upon.

In order to determine whether there had been any noticeable trend during the second year, a careful analysis was made of the new projects proposed and entered upon from July 1, 1926, to date. In this period of eleven months a total of 217 new projects were submitted and approved, 91 of which, or 42 per cent, were in the field of rural economics (not including rural sociology). All other lines—soils, agronomy, horticulture, entomology, plant diseases, animal husbandry, dairying, home economics, and rural sociology—showed a total of 126 new projects.

The fact that 42 per cent of the new investigations inaugurated in this second year are in agricultural economics reflects the consideration which that subject is receiving now that the work has got under way. This would seem to be a matter for much satisfaction and reassurance.

No friend of economic research could wish the number of projects to outrun the supply of workers suited to carry them on. To do so would be to affect the quality of the investigation, which is quite as important as quantity, particularly at the outset. Research, of course, means more than accumulating data or compiling information; it means gathering data for a particular purpose, guided by ability to discern the kind of data necessary, to weigh their adequacy, and to interpret as well as to summarize them.

Men, methods, and money are the prime essentials for growth of investigation, in the order named; but they need to be combined to insure success. The assignment of money is merely the evidence of things hoped for, but alone assures nothing, while methods without the vision and insight and initiative

of trained investigators may mean mechanical routine without research. Hence the man is fundamental; the presiding genius determines the grade of the effort and the size and reliability of the contribution which results from it. But it takes time to train men, especially to a point for independent research.

The Purnell Act came so suddenly and unexpectedly at the last that there was bound to be scarcity of trained workers of ability to meet the needs of forty-eight states. The inadequacy of this supply is generally recognized as having been the principal drawback and source of delay in inaugurating research on so extensive a scale. It has been a matter of no small anxiety to administrative officers. Lacking personal knowledge and judgment in many cases, they have felt to an unusual degree the need of competent leadership, and hence have been slow to establish or enlarge departments of economics until they could obtain investigators who met the usual standards.

One result of this unusual competition for workers and the rapidly growing research branch in the U. S. Department of Agriculture has been a considerable inequality—the building up of relatively large and specialized staffs at a limited number of places, as your Advisory Committee on Economic Research has pointed out, rather than "bringing the standard of work done in any given line at all institutions up to a satisfactory level." As a result, the research is pronounced "very uneven in character."

This seems a fair statement of the situation, which we may expect to see relieved in future by the development of standards for research and the broad training of an increasing number of workers. One of the important products of this new legislation has been the marked stimulus given to students to prepare themselves for economic research "in a manner corresponding to the needs of the work," and in such a way that they can grow with the subject and with the progress of their research. For research is a process as well as a means of growth, and the standards and methods must grow with and out of it. The end is never reached; each step of progress opens up other lines of advance. This is just as true in economics as it has been in chemistry and physics; and so the

warning sounded by the Advisory Committee needs to be taken to heart, that what starts out as investigation in new fields may run into routine service "instead of passing on to further genuine research of the more intricate but valuable type, based upon and made possible by these earlier investigations."

This means the inculcation of standards and motives quite as much as acquaintance with what is in the books. The spirit of research and the attitude of inquiry are an essential part of the equipment, and these are just as applicable where the ends are practical as where they deal with more theoretical considerations. It is mainly in connection with advanced study that the student forms his conceptions and impressions of what research is, of the difference between research and a good thing, the distinction between an economic fact and a bit of information. It is here that he acquires the spirit of inquiry which leads him from a statement of facts to the question, What of it?

So the kind of graduate work matters very much in the preparation for research: its value depends on what one gets out of it, not alone in principles, theories, and facts, but in inspiration for research, means of advancing it, and sense of values.

Another essential whose necessity is seen in some of the earlier work is for continuity and concentration. Without these, efforts are likely to be fragmentary, scattering, and disconnected. There is some evidence of this at the present stage. Complex, intricate, and even fundamental subjects are entered upon and concluded within a remarkably short time. In such cases the subjects are not cultivated and investigated, but simply opened up. The more superficial preliminary things are done—the subject is analyzed, a description is given, the case is stated, and then the worker is off for pastures new. This may come in part from the employment of graduate students or immature workers; it may be partly because the subject is so large, the number of workers so limited, and the demand so insistent. But economic research is passing to the quantitative stage, and in order to make lasting contributions it will be necessary to see a subject through. Research naturally tends toward specialization. It not only leads the invest-

igator from the general to the specific, from the superficial to the more fundamental, but it develops special lines of interest and of judgment, with the disposition to concentrate on particular lines. In this way the worker's knowledge and skill in investigation become expert.

The Report of the Advisory Committee, referred to above, mentions most of these things and gives a very wholesome review of the situation and the ends to be sought. It is a frank, fair-minded analysis, constructively critical, and outlines the basis for a forward-looking program. This is based on the idea that "the principal problem in this field is not so much the stimulation of activities or expansion of progress as it is (1) the promotion of a more effective expenditure of funds already available; (2) the correlation of the various efforts, and (3) raising standards of work throughout the field." The proposal to institute an intensive study of the character, methods, and standards of economic research related to agriculture deserves commendation and merits the hearty cooperation of the experiment stations and other agencies concerned.

EARLY LAND HOLDING PRACTICES IN UTAH, AND PROBLEMS ARISING FROM THEM

LOWRY NELSON
BRIGHAM YOUNG UNIVERSITY

Whether property in land should be public or private was frequently a problem with the early settlers in Utah. Conflict between the religious and ethical idealism of the group and the traditional idea of private ownership of natural resources was common. That the institution of private property should be challenged at all was due, of course, to the intense religious motivation of the group, which emphasized altruism and deprecated selfish aggrandisement. Sacrifice of the satisfaction arising from individual ownership was looked upon as a wholesome spiritual discipline. Consequently there were a number of settlements which were wholly communistic, the land, as well as other property, being held in common.

While these purely communistic efforts suffered the usual fate of such ventures, the germ idea back of them has influenced the evolution of land holding policies in the State to no small degree.

The evolution of land ownership in Utah is well typified in the experience of the community of Ephraim. There never was any effort to establish in Ephraim a communistic order with respect to the ownership of farm lands. In the very beginning the suitable land was cut into 20-acre plots, the plots numbered and drawn by lot by the settlers. This suitable land was in one great field, and the whole was surrounded by a common fence. No effort was made to fence the individual plots until a later period.

There was, however, an extensive natural meadow in the vicinity of the town, and this meadow was the only source of hay. At first it was not divided, and anyone who wished could go down and mow his supply of hay for the year, as far as the supply would permit. As the demand for the hay increased with the increasing population, it became necessary to apportion the hay land in the same manner. Not only must it be apportioned in the community itself, but it happened that there were two other communities interested in the land.

To settle the boundaries as between communities, recourse was taken to the general authorities of the Mormon church.

A member of the quorum of the twelve apostles came out and adjusted the inter-community boundaries, and the ecclesiastical authorities in the communities themselves determined the apportionment among individuals. In the town of Ephraim the latter was determined at first in this manner:

The ruling was made that no one should cut hay from the meadow until after midnight on the 25th day of July. As the individuals arrived at the meadow, each one would seek out the particular patch of forage he desired and with his scythe would mow a swath around it. This provision was made to restrain the gluttonous one: No man should cut a swath around a larger piece than he could mow with a scythe, single-handed, in one day. If he should overestimate his capacity, that which remained standing at the close of the day could be appropriated by anyone who wished it.

One of the present settlers of Ephraim, who was the source of this information, Mr. James H. Hansen, says:

"On the night of July 25, the entire town would dance until midnight, and then you could hear wagons drawn by oxen begin to roll towards the hay meadow."

It became a sort of festival, and while the land was held in common the right to its use was determined in this way.

Later it became advisable to settle private ownership on this land, and it was done in this unique manner. The meadow was two miles in length, and instead of dividing it along section lines as is customary, it was decided that all would share more justly if it were sliced into two-mile strips. The width of the meadow was measured and divided by the number of family heads, and it was found that each would be entitled to a three-rod strip two miles in length. No fences were erected, only pegs driven at intervals of three rods across the "top" of the field. The strips were numbered and each individual drew lots for his portion.

Pasture land was similarly divided so that each individual shared equally with his neighbors. The value of a share in a given pasture varied according to the quality of the land.

The range land, of course, was entirely common until the establishment of the Forest Reserve. Any individual had free use of the range, and no effort was made to limit that use. This still holds with respect to the lands outside the National Forests.

Thus it is seen that in the early development of rights in land and its appurtenances, there was at first a tendency to regard land as common property, with a subsequent and pronounced evolution towards private ownership. It should be noted that even today in many Utah communities there is the community pasture, and there is a time in the fall of the year when it is mutually agreed that all fields shall be opened for common use as pasture. This is merely cooperative use of private rights in the property rather than common ownership, but it represents a hang-over from the pioneer institutions.

The early Mormon settlers, then, in a particular section shared one and all, and that equally, in the distribution of the available land. Even though land might be filed on by only a few individuals, as was the case in the settlement of the village of Escalante, it was mutually agreed among them that they would divide their holdings with others who should come in later. This resulted in small initial holdings, of such size as later to be found uneconomical of operation. The community idea dominated land settlement and no one thought of establishing himself alone in a desirable section. Always the first settlers looked forward to the growth of the community, and in order to attract more members would agree to share part of their land with them.

For example, the first settlers in Escalante, Utah, filed on 160 acres each, but agreed among themselves that they would share it equally with six or seven other settlers, giving him and them only about 20 acres each, a unit which predominates there to the present day.

The first settlers in Ephraim secured only 20 acres each, and later in order to accommodate the large number of Scandinavian immigrants who poured into the community, they each gave up five acres, leaving them a farm of only 15 acres.

It is probably true that they had a very meager idea as to the size of farm which would be most economical for them to handle. And it is well known that they underestimated the possible duty of the water in the streams. They probably calculated that if everyone was to have a piece of land that it would be necessary to have the holdings very small.

It was later found that there were other lands which could

be brought into use in the vicinity, and accordingly the acreage of farm lands was gradually expanded, as it is still expanding in many sections, where it has been thought the maximum acreage had been achieved.

The opening of additional tracts of land gave the holders of the old lands opportunity to add to their acreage. But the new lands, as was the case in Ephraim, were also divided so as to give every family an equal portion, so that this additional acreage was usually small. The result is that in every farm village of Utah there are a great many cases of divided holdings. Many farmers own several pieces of land, located frequently in entirely different directions from the town, and involving a rather serious problem of farm management.

Thus there is a farmer in Ephraim who owns eleven different pieces of farm land scattered in all directions from the farm home in town. This involves the problem of economic use of farm machinery, which has to be transported from one holding to another, the unnecessary expense of extra fencing to enclose the small acreages, and more serious than all the dispersion of interest on the part of the operator, which makes effective farming impossible. The question naturally comes: Why does not this farmer exchange land with his neighbor? And the answer is that either one or the other is not willing to make the exchange. The neighbor's land may be a little closer in, or otherwise more advantageously located, and he is unwilling to trade. At least that is the situation with respect to this man of eleven "farms." He declares that he is unable as yet further to integrate his holdings.

This situation offers an interesting parallel to that existing on the feudal manor, where the land was divided into one-acre strips and a man farming thirty of those strips would have none of them adjacent to each other. That was done deliberately by the landlord, in order that all of the tenants would share in the bad as well as the good land. The Utah condition is not the result of a deliberate program of that sort, but rather has grown out of the equal distribution of the available land in early days among a comparatively large number of individuals, with additions being made subsequently from new lands as they were brought into cultivation.

THE COST OF MARKETING TEXAS CATTLE IN THE OLD TRAIL DAYS

T. J. CAULEY
UNIVERSITY OF TEXAS

The general nature of trail-driving from Texas to the north and northwest during the three decades following the close of the Civil War is fairly well known. In the absence of any other outlet to market, the cattle-men of Texas shortly after the close of the Civil War resorted to the practice of driving their herds overland to northern markets, to the government posts for the soldiers and the Indians, and to the vast virgin ranges of the great and newly opened northwest. The country was open; the grass was free; and the cattle literally ate their way to market.

The first drives were made in 1867, to Baxter Springs, Kansas. The ventures were undertaken by individual cattlemen who were searching in despair for a market for the great surplus of cattle which had come into existence prior to and during the Civil War. The herds driven at first were relatively small, ordinarily only a few hundred head. The success which attended these first efforts however, constituted such a powerful stimulus toward expanded operations that the next few years saw a remarkable increase in the number of trail-drivers and in the size of the herds moved.

Previous to 1870, the industry was chiefly in the hands of relatively small individual drovers who were also stockgrowers. The common practice was for a ranchman to take his own cattle and a few hundred, perhaps, for his neighbors. But shortly after 1870, large concerns appeared in the field—partnerships, syndicates, and even corporations. Numerous individual drovers, however, extended their operations to such an extent that they rivalled or surpassed those of the syndicates. Eastern capital became interested, and the drives were financed by the banks in a business-like manner. Operations ran into the millions of dollars.

With steady increases in the size of the herds moved, it had become common by the middle of the decade 1870-1880, to collect and drive herds of 3,000 head and more. Three thou-

sand head seems to have been about the size of herd for most economical handling; since most of the larger concerns moved their cattle in herds of approximately that size; but there are numerous instances in which herds of 4,000 and 5,000 head were moved all the way from the coast country of Texas to Montana and the Dakotas.

For a herd of 3,000 head or thereabouts, there were ordinarily employed a minimum of 9 or 10 cowboys, the boss, and the cook. Usually there was a specialist, a horse-wrangler, in addition to the regular cow-hands. The number of men required did not increase in exact proportion to increases in the size of the herd up to, perhaps, three thousand head. That is, it did not take twice as many men to handle a herd of 3,000 head as it did one of 1,500. Consequently, there was a strong incentive to increase the size of the herds up to that point. Herds of materially more than 3,000 head seem to have presented special difficulties, however, which counter-balanced any economies which might have come from such large scale operations.

Ordinarily from six to ten horses were furnished for each rider. Some of the drives—particularly those in cold or rainy weather—were extremely hard on the horses; and it was not uncommon for a herd to arrive at its destination in the foothills of the Montana Rockies with half or more of its horse-stock gone. The horses used were usually mustangs or "Spanish ponies" and extremely wiry and tough; but the long drives and the over-work sometimes wore them out.

It was common for the larger operators to have 10, 15, or even 20 herds on the trail in one year. Colonel Ike T. Pryor, a typical drover, had 15 herds of approximately 3,000 head each on the trail in 1884. His operations during several other years were of similar magnitude. Blocker, Driscoll, and Davis had for a number of years over 20 herds on the trail each season, some of which were well over the standard size of 3,000 head. As late as 1889, when trailing was well on its decline, Ab Blocker moved a herd of 3,700 head of mixed cattle from west Texas to the Belle Fourche River in Wyoming for this firm.

There are no very reliable figures as to the total number of cattle driven out of Texas to the north and northwest during

the whole of this great pastoral movement; but various estimates made by individuals who are familiar with most of the available facts in the case have placed it between 8,000,000 and 10,000,000 head.

The cowboys employed to drive the herds usually received wages of $30 a month and board; although in some instances higher wages were paid. One writer speaks of being able to take the pick of the cow-hands in two counties of south Texas by offering them $50 a month and pasturage for their horses at the home-ranch while they were away on the trail.[1] It is unnecessary to point out, of course, that a wage of $30 a month meant a great deal more in the seventies and eighties than it does now. The cook and the horse-wrangler ordinarily received the same wages as the other hands. The boss was the moneyed plutocrat of the outfit. He commonly received $100 a month for his services; and he was not overpaid. The bossing of a trail outfit with the responsibility, judgment, resourcefulness, and plain hard-work which it involved appears to have been a job calling for a man of parts.

The total pay roll for the typical herd was thus between $400 and $500 a month. In a month's time, such an outfit could move a herd between 400 and 500 miles, a herd usually making an average of about 15 miles a day. Thus it cost in wages approximately $1 to move 3,000 head of cattle 1 mile; although there are instances in which the total cost of moving a herd was no greater than this per mile.

The cost of provisions for the men as furnished by the cook with his chuck wagon, amounted ordinarily to about $100 a month. A portion of these was purchased at the beginning of the drive, and more at the scattered towns and trading points along the route. The store-bought supplies were supplemented by vast quantities of fresh beef.

The percentage of losses suffered by the herds of the different drovers varied considerably. In some few cases it amounted to almost 100 per cent as the result of the ravages of tick fever; but in the main, Texas cattle had become relatively immune to that disease. Untimely blizzards were responsible

[1] Adams, A., *The Outlet*, p. 15. Cf. The Trail Drivers of Texas, edited by J. M. Hunter.

for heavy losses in some instances, and the crossing of swollen streams frequently meant the loss of several head. Stampedes were sometimes so complete that some of the cattle were never recovered; and in the early days, the Indians of the Territory usually exacted a toll of a few head, either directly or indirectly. But in the later days of the period, due to the employment of better methods, losses were reduced in most cases to not more than 2 or 3 per cent.

The incidental expenses involved included among other items payment for property of one sort or another destroyed by the cattle along the route. The herds had a way of breaking into the corn-fields of the grangers along the trail; and when they encountered a frontier town, they were apt to investigate things in general, frequently with disastrous results. Fines for trespass were occasionally imposed; but Kansas sheriffs had a notoriously hard time in collecting such revenues.

The trail-drivers sometimes raised all or a part of the cattle which they drove, but more commonly they were simply middle-men. That is, they bought the cattle in Texas and sold them in Kansas, Nebraska, or elsewhere. In the beginning, trail-driving was merely a part of the general industry of raising cattle; but in the later years of the period, it was a highly organized business carried on by specialists.

At that time cattle were scarcely if ever sold by the pound. Beef cattle were classified as yearlings, two-year-olds, three-year-olds, etc. All "she-stuff" was usually lumped together. Within these classes, a flat price of so much per head was quoted. Such prices varied, of course, from year to year; but in general, they were higher during the first two decades of the period than for the two following ten year periods.

Some drovers—particularly the smaller ones in the early years—drove their cattle north simply in anticipation of finding a buyer; but their frequent disappointments in this matter taught their successors to drive, in so far as possible, only cattle which were already under contract. Thus most of the larger factors operating during the eighties secured contracts covering the sale of their herds before they were bought down in Texas. As indicated before, the government was a heavy purchaser of beef for its troops and for the Indians on the reser-

vations under its supervision. The ranchmen of the northwest were another important source of demand; and, of course, there were the packing-houses of Kansas City, St. Louis, Chicago, etc. However, the trail-drivers ordinarily did not sell directly to the packers, it being necessary to winter the Texas steers in the north before they were ready for this market.

Good business policy demanded that the drovers allow themselves a margin of from $3 to $4 a head between the contract sale price and the purchase price which they expected to have to pay.

On the basis of the cost of marketing as estimated above, this left the drover a profit of at least $2 a head or $6,000 on a herd of 3,000 head. In the case of those concerns moving from 15 to 20 herds in a season, the profits would thus run in the neighborhood of $100,000 or more. Most of the fortunes which have been built up in Texas and the southwest had their beginnings back in the trail-driving days.

If we compare the $3,000 or so which it cost to move a herd of 3,000 head of cattle from south Texas to Montana in 1884, with what it would cost to do the same thing at the present time, we find a balance of well over $20,000 in favor of the older method, since railroad transportation in such a case would amount to between $25,000 and $30,000. Shipment by rail cannot approach the economies of overland trail-driving. Conditions prevailing over a considerable portion of the trail-driving period, support this statement. During the eighties there were rail connections between south Texas points and Wichita Falls, over the International and Great Northern, the Missouri, Kansas, and Texas; and the Fort Worth and Denver railroads; but with relatively few exceptions, the drovers refused to use these facilities, finding it cheaper to drive their herds overland, although the drive required from four to six weeks, whereas the railroads could deliver cattle at Wichita Falls in 48 hours.

All of which brings us to the conclusion that, contrary to the commonly expressed opinion, the railroads did not kill trail-driving through competition. Trail-driving ceased because the trail disappeared. It was over-run by grangers; barbed-wire fences crossed it; and the free grass was plowed up to make room for wheat, corn, and cotton.

CANADIAN FARMING SINCE CONFEDERATION

J. E. LATTIMER
MACDONALD COLLEGE, QUEBEC, CANADA

The celebration of the sixtieth anniversary of the birth of the Dominion at this time directs our attention to the development and expansion of agriculture during that period. Sixty years is not a long period to consider even though it be the age of infancy of a country. The development of farming in this period though not without its shadows has been on the whole fairly bright and in some phases sufficiently brilliant to be almost incredible.

Some conditions prevailing sixty years ago resemble fairly closely those confronting the country generally and the farming industry in particular at the present time. Sixty years ago Canadian farmers were looking back upon a period of higher prices and more prosperous times in much the same way that they are at present. The Civil War in the United States and the following period of inflation had furnished Canadian farmers, who then had free entry to the market of the United States by the Treaty of Reciprocity (1854-1866), with a market for their products at what Adam Shortt has aptly termed "Crimean prices." Prices which had been ruling high for a decade were declining. This is not unlike recent experiences.

The abrogation of the Treaty of Reciprocity by the United States in 1866 necessitated the development of markets more remote. Recent customs regulations in regard to the products of the Canadian farm in the United States market are strongly reminiscent of sixty years ago. Again when Canada extended only as far west as the Great Lakes one-quarter of the Canadian-born were located in the Republic. We have heard recent complaints from both sides of the line about the magnitude of this interchange of population.

Of the half century from 1871 to 1921, which comprises the greater part of the period under discussion, the first twenty-five years was a period of declining prices, while the twenty-five years from 1896 to 1921 was a period of rising prices. The trough of the depression was reached

in 1896 when one Ontario farmer established a greater reputation for integrity than for common sense by hauling oats 15 miles to market and selling them at 16 cents per bushel to pay his rent. In that same year (1896) Canada exported 9,919,542 bushels of wheat valued at $5,771,521 or an export value of 58 cents per bushel, while the butter exported amounted to 5,889,241 pounds valued at $1,052,089, an export value of about 18 cents per pound.

It is prices of an earlier date in which we are particularly interested. The New York price of wheat for the three years 1866-1869, inclusive, averaged $2.27 per bushel. The New York price for the three years from 1918 to 1920, inclusive, was $2.45 per bushel. This looks interesting. The price of wheat in England was 64S.5d. per quarter in 1871, in 1896 it was 22S.10d. per quarter or scarcely more than a third as much, while in 1910 it was only 34S.8d. per quarter.

In 1871 Canada produced 16,723,873 bushels of wheat valued at $16,993,265 or about $1.02 per bushel. The 1926 crop was some 409,811,000 bushels valued at $1.09 per bushel. The similarity in the price of wheat is striking. The prices of dairy products exhibit much less similarity to the price of 1871. In that year there were some 5 million pounds of butter exported valued at slightly over a million dollars or almost exactly 20 cents per pound. The export value of the butter disposed of in 1925 was around 35 cents per pound. These facts stress the point that is claimed here, which is that the higher prices of the present when compared with sixty years ago are much more marked in some lines of farm products than in others. This is not stressed to show that some lines may of necessity be more profitable on this account. Low prices are not necessarily and always unprofitable.

Sixty years ago some three and a half million people in Canada, the most of whom lived on or near the farm but did not live entirely by farming, established the Dominion. At that time there were only the four provinces of Ontario, Quebec, New Brunswick and Nova Scotia included. Shortly after this time three more provinces were added. The entry of

Prince Edward Island was facilitated by the Federal Government arranging for a loan of $800,000 to buy out the absentee landlords who had been granted the Island over a century before. The addition of Manitoba was made possible by the purchase by the Dominion of about nineteen-twentieths of the vast interior held prior to this time by the Hudson's Bay Company. The province of British Columbia west of the Rockies was persuaded to join the federation on condition that a transcontinental railway should be constructed. The construction of this railway stipulated in the terms of the agreement by opening up the western wheat lands made possible the expansion of farming to which we now may turn our attention.

The Census Reports of 1871 and 1921 furnish the following figures:

	1871	1921
Population	3,689,257	8,788,483
Acres of land occupied	36,046,401	140,887,903
Acres improved	17,335,818	70,769,548
Acres cropped	11,821,216	59,635,346
Number of farms	367,862	711,090

The Census of 1871 covered only the four provinces which first combined to form the Dominion. These provinces had been settled for some considerable time and the farms then occupied were fairly well improved at that date. Still for a decade after this time importations of farm produce were almost as important as were the exports. It is easy to explain why production in the aggregate was not large sixty years ago. Farming was on much more of a self-sufficing basis than is the case at present. Industrial centers were not important and manufacturing such as existed was carried on largely at local "mills" the small towns and villages. The census of 1871 credits the country with the production of 7,641,917 yards of home-made cloth and carding and weaving were two important vocations enumerated.

A greater proportion of the food, fuel, shelter equipment and clothing required by the farm family was home-produced than is now the case. The aim was to produce what was required by the family rather than to cater to market demand. Since that time the provision of transportation and the introduction

of refrigeration have made it possible to depend upon remote districts for the provision of certain needs. Today five of the nine provinces are importers of wheat though this is among the leading exports of the country.

It is not surprising that production in the aggregate was not large sixty years ago. The farms were numerous but small. The average area of the farm was 98 acres, 47 improved, and 32 cropped. Yet this small acreage required more man labor at that time than a larger area does at present, as the cradle and the flail were common equipment then. In 1921 the average area per farm was 198 acres, 99 improved, and 70 cropped. With equipment of much greater capacity and larger farms, production per man is much greater. In the period, while the number of farms scarcely doubled the area occupied was multiplied approximately four times and the cropped area became five times as great.

The great expansion during the period has resulted in greatly increased exports. In 1871 the value of the exports of wheat and flour amounted to some $3,500,000. In 1925 the value of these articles exported was some $322,000,000. During the five years from 1921 to 1925, inclusive, the exports of wheat and flour have averaged annually some $315,000,000. The table shows the expansion in wheat production during this period.

WHEAT PRODUCTION CANADA 1871-1926

Year	Acreage million acres	Production million bushels	Production million dollars
1871	1.6	17	$17
1881	2.4	32	39
1891	2.7	42	32
1901	4.2	56	36
1911	8.9	132	105
1921	23.3	301	243
1926	23.0	410	445

Dominion Bureau of Statistics.

This expansion owes considerable to better yields per acre and much to the introduction of earlier varieties which lessens the danger from frost. The great expansion, however, is on account of the increased acreage while no small amount of the recent profit in this line is perhaps due to the fact that Russia during the last decade and a half has not been exporting wheat.

The dairy industry in Canada is nationally a fairly close second to wheat production. Figures for production are not available for the early years. The value of the production has, however, been estimated. In 1871 this industry, just emerging from the home-made stage, was not important. There were, however, at that time 1,251,209 cows reported and the estimated value of dairy products was some $15 million or an average of some $13.60 per cow. In 1926 there were slightly over three times as many milk cows in the country, 3,951,335, while the value of dairy products was some $241,000,000 or some $61.00 per cow. Thus while the number of cows became three times as great the value of the product was multiplied by some sixteen times. This would be very gratifying if it were true. And with some important qualifications it is true. The explanation is that the money gleaned from the dairy industry sixty years ago was almost entirely from butter and cheese. Markets for fluid milk and cream were unimportant, while markets for condensed milk were non-existent. Consequently at the earlier date much of what is now sold was consumed at home or wasted and thus escaped statistical computation. Nevertheless with all these modifications it remains that better cows and better methods are producing more as the table suggests.

DEVELOPMENT OF DAIRY INDUSTRY 1871-1926

Year	Number of Milk Cows thousands	Value of dairy products million dollars
1871	1,251	$15
1881	1,596	23
1891	1,857	30
1901	2,409	66
1911	2,595	103
1921	3,737	205
1926	3,951	$241

Dominion Bureau of Statistics.

The development presented in these figures is accounted for by many factors. Improved breeding and feeding and better methods generally have enabled the aggregate production to increase much more rapidly than has the number of cows. The development of markets and increased con-

sumption of dairy products has made the expansion of the industry possible. These factors together with enhanced prices, no small amount of which in this case must be attributed to improved quality, have made the increase in value of the product five times as great as the increase in the number of milk cows.

In some of the older provinces such as Ontario, the increase in production per acre is considerable. In general more apples are grown from fewer trees and fewer acres than some time since. The acreage in potatoes has expanded very little since 1871, still sufficient are produced today for almost three times the population which then existed. Greater production per acre and per unit is apparent. Even the hens are taking it up and in the more salubrious climate beyond the Rockies one hen has demonstrated possibilities by laying 351 eggs in 365 days.

Just how this expansion has affected the income of farmers generally appears to be a vexed question at the present time. Unfortunately data on returns per farm are very scarce prior to 1900. At that time prices were unduly low. For this reason figures from the 1890-1900 base are very unfair to farming, as that was a decade of extremely low prices for farm products. For this same reason starting from 1900 gives a poor perspective of the industry. But the estimated value of the field crops produced in 1871 is available. The value of field crops and the number of farms in that year and since are figures that are interesting:

Year	Number of farms	Value of field crops	
		Total	Per farm
1871	367,862	$111,116,606	$302
1901	511,078	194,953,420	381
1911	682,329	384,513,795	564
1921	711,090	931,865,000	1,315
1926	------	1,121,447,100	----

The value of field crops per farm was $302 in 1871. Thirty years later the value of the field crops per farm was only $381. Prices had declined from 1871 to 1896 as we have noted. The net result was that though the number of farms had increased considerably in the first half of this

period, the increase in the value of the product was not marked. The increase in the later years is more impressive. Compare the year 1911 with that of 1926. Since that time, though accurate figures are not available for the later year, it is clear that not many farms were added to the total number. The year 1926 is far enough removed from the period of inflation to be of some value in comparison. What do we find? The value of the field crops produced in 1926 was just about exactly three times the value of the field crops produced in 1911. This comparison would appear to demonstrate that the prosperity of farming did not entirely cease in this country after 1921. It would also indicate that if, as is generally conceded and stressed at the world economic conference at Geneva, farming is not as remunerative as it should be, then, the logical method of improving the relative position might be for the industry to endeavor to follow the system which has improved some other industries, namely, fewer farms producing more products. This is what is being done and is a remedy in the best interests of the farming class and not out of harmony with society in general.

BOOK REVIEWS

Balancing the Farm Output, by W. J. Spillman, New York; Orange Judd Publishing Company, 1927. Pp. 126.

This book of 126 pages is directed toward certain phases of the much discussed agricultural problem. By balancing the farm output, the author means "adjusting the production of farm products to market demand in such a manner as to enable the farmer to get a fair price for his products." A fair price, in this case, is "a price that will on the average, meet the expenses of production, return current rates of interest on investment, and pay current wages for the unpaid labor of the farmer and his family."

The author begins his description of the agricultural problem by dividing the farm enterprises of the country into two groups; first, the minor crops, and second, the major crops and livestock enterprises. The second of these groups is made up of the five crops occupying more than 37,000,000 acres of land—corn, hay, wheat, oats and cotton. With these as major enterprises, the author includes dairying, beef cattle production, and presumably hog production. In the first group, he includes all of the crops which occupy less than 37,000,000 acres each.

The author's contention with reference to the minor crops is that adjustment to meet changing price conditions can be made with relative ease if the farmers will react intelligently to available information on the conditions and forces which are shaping the future course of prices. It is in connection with these minor crops which he discusses the work done by the United States Department of Agriculture through its Outlook and Intentions reports. Since Professor Spillman has been intimately connected with the development of this excellent service during the last few years, he is in a position to speak authoritatively upon it.

It is in relation to the gathering and dissemination of economic information that the author presents his first main proposal. It is for a country-wide organization of farmers into what he terms "a farmers' statistical service," in which he would enlist every farmer in the United States in a great body of local organizations on the rural school district basis. He terms it "a plan bold enough to arrest universal attention, and sound enough in outline to command respect." Briefly, the function of these local organizations would be two-fold: (1) To serve as a means of getting the information contained in the Outlook and Intentions reports to each and every farmer, and (2) To report actual acreage and volume of production of the various products, thus securing comprehensive data on agricultural production which would supplement or even take the place of information now available from other sources.

While the author's presentation of the plan is so brief as to preclude extended argument, the reviewer sees in it by implication certain underlying premises. It is upon the basis of these premises, rather than upon the author's explicit statement, which the reviewer ventures to comment upon this plan. It seems to be based upon the assumption that if only the participation of practically all farmers can be secured, collective

action of a rational and effective nature will follow as a matter of course. Disregarding the practical difficulties to be encountered in such a program in the way of getting anything like universal participation, the reviewer would take issue with the underlying assumption. It seems extremely improbable that unity of action can be secured merely through universal assent. Farming is a highly individualistic enterprise. Unity of action without unity of control and the sacrificing of individual prerogatives seems a thing not be expected. The issue appears to be between mass action as contemplated under the proposed plan, and the collective effect of individual action resulting from education in economic ideas, and the popularizing of economic information. It would seem that the latter promises more toward reaching the desired end.

After his discussion of the minor crops and the proposal of the plan described above, the author takes up in Chapter IV a discussion of the problems involved in the major crops. This brings him to the question of surpluses. On page 42, he presents a table in which he indicates the approximate acreage of surplus production of the various crops. Surplus in this connection means production in excess of domestic requirements. It does not, in all cases, mean exportable surplus, for the author has evidently included a considerable portion now used on the domestic market, but which, in his opinion, contributes to a lowering of the price below the level indicated as fair.

It is interesting, in this connection, to note what he has determined with reference to the effect of the decrease in number of horses. His figures have it that 20,000,000 acres less of corn, oats and hay are required for the support of work stock in the United States than were necessary in 1918. This seems an excessive estimate. Dr. Baker, of the Department, estimates this reduction to have been 9,000,000 acres between 1920 and 1925. Professor Spillman's period is a little longer but the discrepancy is marked. Altogether, the author estimates that 39,000,000 acres of American crop land is producing surplus product. He adds to the crops already mentioned 9,000,000 acres of wheat and 10,000,000 acres of cotton.

The author proceeds to discuss certain specific aspects of the various surplus products. He believes it to be very difficult to adjust the corn acreage by reduction without seriously crippling the agriculture on our best corn lands. He feels also that there is no prospect of reducing the oats and hay acreage sufficiently to make good profits. He is more optimistic with reference to wheat in view of the opportunity to substitute dairying and other enterprises. His statement with reference to dairy products has to do with the period from 1910 to 1920 in which the dairy enterprise was, on the whole, contracting. He fails to follow the development of dairying through the last six years, during which time it has expanded considerably in the Middle West and contracted somewhat in the East. Similarly, the more recent developments in the beef cattle industry tend to be of a more optimistic character than the author's comments would indicate. Curiously enough, the author has omitted all discussion of hogs from this chapter on the agricultural surplus.

The author's position seems to be that in the case of these great surplus products there is no hope of adjustment immediately as a result of the dissemination of economic information. It is therefore necessary, if the producers of these great staples are to be put into a prosperous condition again, that government action be taken. Accordingly, in Chapter V, he presents a number of arguments in favor of government interference. The tariff, the highly organized condition of non-agricultural industries, the effective way in which exportable surpluses of industrial products are being handled, recent credit legislation, the wages of organized labor, and recent railway legislation all are cited as indications of how government action has worked to the benefit of the non-agricultural classes, and how, when properly shaped, legislative measures might be helpful to agriculture.

In the following chapter the author discusses numerous proposed remedies. Production and export bounties, price fixing, production under price contracts, the Australian scheme for stabilizing the price of butter, the German import certificate plan, Brazilian coffee valorization, the Stevenson rubber plan, and others are brought forward for comment and criticism. He sees very little in any of these schemes which might be taken over in a comprehensive plan for benefiting the producers of American agricultural surplus products. Curiously enough, in the discussion of proposed measures, no mention is made of the scheme which has attracted most attention during the last several years, namely, the export corporation plan, or what is ordinarily known as the McNary-Haugen proposal.

The author, however, has a plan of his own which he presents in Chapter VII. He calls it "the Limited Debenture Plan." It, like the McNary-Haugen system, has for its objective securing the benefits of tariff upon agricultural products. Briefly, the plan is that the government shall authorize the organization of a commission which shall have power to license and bond the dealers operating in a given protected commodity, and to determine how much of the commodity shall be sold at a figure high enough to give the producers the benefit of the tariff. All of the commodity in excess of this amount must be sold at the world price. It would be necessary to allot to the producers the amounts each may sell at the protected price. This allotment is to be based proportionally on the amounts each producer has been supplying before the plan goes into effect. This will, of course, involve keeping a record not only of what each producer grows, but of what he sells. The plan involves utilizing State Agricultural Colleges and the State statisticians of the United States Department of Agriculture in the keeping and using of the necessary records.

The benefit of the tariff is to be secured by requiring each dealer to buy from the Federal Tariff Commission "debentures" in amounts limited to his purchases. Buyers are to purchase the product at the world price, but at the end of the season, the Commission remits to each producer, from the sale of the "debentures," his pro rata share of the tariff benefits.

The plan is a complicated one, and space is not available to present the details of it in this review. With all due respect to Professor Spillman's long study of the agricultural problem, and particularly in view of his effective activity since the war in the direction of agricultural readjustment, the reviewer is forced to voice his skepticism of the workability of such a plan. The necessary machinery would be too complicated. To him, the equalization fee and the export corporation look simple in comparison. However, granted its workability, it would seem that such a plan might be the means of separating the home market from the foreign market for price determining purposes.

In Chapter IX, the author discusses the prevailing arguments against government interference in agricultural readjustment. He defends the general program of government activity against those who profess to believe that legislation has no part in the solution of the agricultural problem. In his final chapter, he discusses briefly the farmer's response to economic forces.

It seems to the reviewer that Professor Spillman raises two fundamental issues in this little book. The first is as to the efficacy of economic information for the farmer. The author's position with reference to the need of expanding and making more effective this work of the Department and colleges is doubtless shared by everyone who has anything like an adequate understanding of the present agricultural situation. It would seem, however, that Professor Spillman tends to neglect the importance of what may be called economic education of the farmer in this connection. Any plan that does not take the farmer into account as an independent proprietor and master of his own economic destiny is, to say the least, an imperfect plan. It seems that the author is too sanguine in his expectation of the prompt and spontaneous way in which the reaction to economic information will come. The reviewer believes it will be a matter of gradual education on the part of the farming class.

The reviewer finds himself in disagreement with the author's other fundamental contention, namely, that of the efficacy of the right sort of governmental action in the solution of the surplus problem. Here again, it would seem, economic education of the farmers, which will lead to their use of resources in the best available way, is the most promising means. This is not to say that there is no place for agricultural legislation. A great deal needs to be done by the government toward equalizing the opportunities in agriculture with those in other industries. However, it would seem that legislation should be directed not in a frontal attack on prices as such, but toward a rational policy of land reclamation, direct tariff adjustment, the railway situation as it affects agriculture, and keeping open the opportunities of profitable employment in the organized trades to those who are moving away from agriculture. It would seem that the activities of the farm bloc, to be of maximum benefit to its agricultural constituency, should be directed toward these more fundamental considerations rather than toward highly complicated schemes of price adjustment.

C. L. Holmes.

Iowa State College.

Making the Most of Agriculture, by T. Macklin, W. E. Grimes, and J. H. Kolb, Boston; Ginn and Company, 1927. Pp. Vi + 542.

Making the Most of Agriculture by Messrs. Macklin, Grimes, and Kolb is a three-in-one product. The book is an attempt to treat in one volume three difficult problems, namely, marketing of agricultural products, farm organization and management, and rural life.

In the foreword, the authors declare that agriculture stands at the crossroads. It will be recalled that similar statements have been made regarding our civilization, which no doubt includes our agriculture. It would appear, if our history is not all bunk, as averred by Mr. Ford, that both agriculture and civilization have made the crossroads a more or less permanent stopping place. Hence, such statements relative to agriculture or civilization mean little and get us nowhere. But the authors of this volume mean apparently that the farmer has depended almost solely upon the physical productionists for so long that their condition is pitiable. The advice of these productionists alone does not make plowing and feeding into a modern business. And, "That the unsolved problems of the past which have brought the American farmer to the crossroads may now be solved, is the challenge which calls forth the new point of view for agriculture. It is the point of view which unites the *social sciences* with the physical and biological to make agriculture the balanced opportunity for working and living, which should be the heritage of every boy and girl."

There is no question, among economists at least, that the productionists have been the cause of some of the farmers' troubles. But it would be manifestly unfair to hold them responsible for all the difficulties of the farmer. The rapid expansion of our land area, and the development and use of machinery have played their part in increasing agricultural output and in lowering prices to unprofitable levels. And during the war the food propagandists backed and fostered by government agencies and some eminent economists have been responsible for a large part of our present troubles.

It is not, of course, possible nor necessary to discuss the contents of the book in detail. The first chapter elaborates what is termed "the new view point of agriculture." The point of view taken is, that profits in agriculture depend on efficient marketing and efficient production. And, if the reviewer is not mistaken, the point is made that worth while living also depends on profits.

Chapters II to XIII inclusive are devoted to a statement of the marketing problem and its solution. A general notion of the object of these chapters, as held by the authors, is contained in the following statement:

"Marketing is a social machine that must be understood to work well. In fact, to secure the best results from any machine we must understand it. To gain this understanding we need to look the machine over, take it apart, put it together again, and try it out. This is what will now be done with the marketing system, that social and economic machine upon which all depend."

Chapter II elucidates the commercial point of view. This view requires that the farmer must (1) determine the demand for his products, and then adjust his production accordingly; (2) carefully calculate production cost so that each cost will not rise above prices of his products when sold; and, (3) assure himself of profits before undertaking production.

The commercial idea is the point of view held throughout the text. The weakness of this point of view is based on the following considerations: (1) To assume that farming is a business in the same sense that a manufacturing or commercial enterprise is a business is erroneous. Farming is still, in part at least, self-sufficing industry and to the extent to which this is true the farmer is not compelled to balance money costs against prices. (2) The predominating characteristic of farming is small scale production in which the function of management is associated with ownership. (3) Production is only in part under the control of the farmer. That is, it is more subject to weather conditions than are commercial or manufacturing enterprises. (4) Farming as at the present time requires little professional training. (5) Agricultural products are not easily standardized. And, (6) agricultural production is not easily insurable. These and other characteristics which are common to agriculture are sufficient to make the solution of agricultural problems more difficult and different from the solution and treatment of commercial and manufacturing problems.

In spite of this we find in chapters II to XIII inclusive a discussion of an elaborate marketing system for agriculture. This treatment measured by standards which have been established must be viewed as satisfactory. One can imagine, however, a somewhat different treatment and possibly a more adequate one if the fundamental characteristics of agriculture are viewed in somewhat different manner. Modern criticism has established the fact that any adequate solution of the farmer's problem cannot be based entirely on individual initiative, or what is commonly viewed as organized cooperative movement. But to understand why this is so, one must understand the fundamental nature of agriculture itself.

It should not be inferred from this criticism that the section on marketing does not contain good material. The material is for the most part well organized and clearly presented, although there are many obvious and irrelevant statements. The chief criticism which may be applied is that the author tends to over-emphasize the possibilities of marketing as a remedy for the agricultural problem.

The second group of chapters (XIV to XXV) of the *Making of the Most of Agriculture* deals with farm organization and management. The idea that farming is a full-fledged business is taken for granted so that this section is open to the same general criticism as the section dealing with the marketing of agricultural products. In addition, these chapters may be criticised in that the treatment of the subject shows little effect of modern research. This is to be regretted, because statistical analyses of farm management data have revealed the fact that

a new approach to many of the problems in this field is necessary. One is perplexed somewhat to note that the references are largely to Warren's Farm Management and Carver's Rural Economics. In the light of the many latest publications, bulletins as well as books, it might be expected that other references could have been used more effectively.

The section of the book dealing with rural life (chapters XXVI to XXXVII) is evidently the work of Mr. Kolb. Of the three sections of the book, this deals with the most vital problem in the field of agriculture. Any adequate understanding of the farmer's mind would tend, I believe, to place the emphasis on the problem of rural life. Yet the authors emphasize the fact that the rural social problem cannot be solved unless the marketing and production problems are solved first. The truth is that the solution of the marketing and production problem is being retarded seriously by the social ideas held by farmers. Their political, social, and more especially their religious notions are at present the serious barriers to progress.

After reading this section of *Making the Most of Agriculture*, one feels that the author did not make the most of his opportunity. Nowhere does he stress the necessity of understanding the development of our fundamental social institutions and ideas. On the other hand, there is a marked tendency to play up the material things such as good roads, school buildings, church buildings, and other community buildings as indications of rural progress. These, as every careful student recognizes, are in many cases only outward manifestations and may or may not indicate that progress has been made.

G. W. Forster.

North Carolina State College.

Rural Life at the Crossroads, by Macy Campbell. Boston; Ginn and Company, 1927. Pp. X + 482.

This book apparently is intended to be a diagnosis of the ills of agriculture and a prescription of remedies. The ills portrayed are mainly of economic origin and the remedies are those of cooperative marketing and education. The twenty-three chapters may be roughly classified as follows: The first three seek to develop the idea of the decadence of agriculture and the rural population. The next eight deal with cooperative marketing. Chapter XII touches upon such questions as the tariff, surpluses and finance. The remainder of the volume deals mainly with educational and related problems.

The book opens with the striking heading, "Is there to be a Farm Peasantry in America?" Increased tenancy, increased mortgage indebtedness, excess taxation on farm property and the depreciated buying power of farm products are the props supporting an affirmative answer. Naming important fundamental problems and applying proper analysis leading to sound conclusions, are tasks of different magnitude. One may agree with the author that the problems raised are serious without

committing himself to the conclusions drawn by him. Talk of "peasantry" is popular in some circles. It attracts attention. It stimulates the imagination. However, there are some who refuse to be so easily frightened by this spectre. They have a hard time to conceive of a picture with such sharp contrasts as one that portrays peasants on the farms and prosperity among city workers in town.

The subject matter requires a more fundamental economic analysis than is given by the volume under review. Although the author indicated that it is the outgrowth of years of research, this has evidently been in the educational rather than the economic field. The reader encounters various statements and conclusions which are suggestive of lack of adequate familiarity with some of the matter discussed. Much stress is laid on a contrast between industry and agriculture from the standpoint that the one is representative of organized and the other of individual effort. In this comparison, sufficient consideration is not given to fundamental distinctions. Denmark is held up as a model. Without taking any credit away from the Danes for their leadership in cooperative marketing, one may wonder how many Iowa farmers are ready to "swap" standards of living with Danish farmers. Denmark's cooperatives are demonstrations of the value of service, of proper grading, of adjustment to market demands, rather than of market control.

The chapters on education supply some interesting illustrations of consolidated schools. These descriptions would seem to counterbalance somewhat the pessimistic attitude displayed elsewhere with respect to the decadence which is supposed to be taking place rapidly in rural life.

The appearance of this book gives cause for gratification in the suggestion it brings that leaders in the development of rural teachers are awakening to a keener realization of the need for stressing the economic aspects of agriculture. It, no doubt, will stimulate added interest in cooperative marketing among agricultural high school teachers and other rural educators. One wishes especially for that reason that it had dealt more adequately with the real fundamentals of cooperative marketing. It is to be hoped that beginners in the field will not stop with this treatise but will be encouraged to seek added light on economic problems from other sources. There has been some agitation for the inclusion of courses in cooperative marketing in high schools. Such courses built on an understanding of economic principles and dealing with the fundamentals of cooperation will be helpful. Based on half-truths and propaganda, they might become very harmful to the cooperative movement. The reasoning and the principles involved in cooperative marketing certainly are no simpler than those of other subjects for which adequate understanding and training in subject matter are required of teachers before they are turned loose in the school room. Successful cooperative marketing education in high and graded schools requires more than suitable texts. Trained teachers also are necessary.

O. B. Jesness.

University of Kentucky.

The Green Rising, by W. B. Bizzell, New York; The Macmillan Company, 1926. 264 pp.

"The Green Rising," by W. B. Bizzell, now President of the University of Oklahoma, formerly President of the Agricultural and Mechanical College of Texas, takes its appropriate title from a phrase originating with G. K. Chesterton, and used by him to signify agrarian unrest as distinguished from the "Red Rising," a proletarian movement. President Bizzell's book is "An Historical Survey of Agrarianism, With Special Reference to the * * * Farmers of the United States States * * *." For a long time there has been need for such a survey. Students of Economics and Economic History were therefore delighted to learn that it had been undertaken by one whose public interests have established intimate contact with the problems of agriculture.

A study of this kind must include first, the marshalling of much descriptive material and second, an adequate interpretation of it. The limits set for "The Green Rising" are too narrow to permit the satisfactory presentation of the necessary historical detail. Unfortunately, the interpretation is, for the most part, contained in the 54½ pages (1616 lines) of quotations from sources such as The Jefferson City Capital News, Matthias Orfield, Lyman Carrier, H. G. Wells, B. M. Anderson, Ifor L. Evans, Ramon P. de Negri, Aaron Sapiro, E. A. Ross, James G. Balleigh, Representative O. B. Burtness, The Progressive Farmer, Robert Morss Lovett, Herbert Quick, O. M. Kile, J. R. Howard, The Washington Post, and so on. One looking forward to President Bizzell's own interpretation of the agrarian movement will be disappointed after having been offered the conflicting conclusions gleaned from the wide range of quoted sources.

It is also unfortunate that the descriptive materials, aside from being inadequate, are in many places erroneous. For example, it is said (page 114) "The early policy of rapid disposal of public lands for the purpose of providing revenue caused the government to offer land for sale in large quantities, six hundred acres being the minimum one could buy." The minimum at the time referred to was 640 acres, not "600." In the same paragraph it is said, "The Act of 1800 permitted the sale of land in minimum tracts of a hundred and sixty acres." This, also, is erroneous. The minimum one might purchase under the "Act of 1800" was 320 acres. It was not until 1804 that the "minimum" was reduced to 160 acres.

A curious combination of mathematical error and economic fallacy appears on pages 240 and 241. President Bizzell says that "In 1921 this country produced 814,905,000 bushels of wheat. It cost $1.40 to produce the crop, and it was sold by farmers for $1.01 per bushel. The net loss per bushel therefore was 39 cents, or an aggregate loss of $314,558,330." The multiplication is in error. When 814,905,000 is multiplied by 39 cents the result is $317,812,950, not "$314,558,330." This error seems incomprehensible, but one like it is found again in the

calculations for 1924. The loss of "12 cents per bushel" on "864,565,000 bushels" aggregated not "$101,789,964" but rather $103,747,800, an arithmetical error of $1,957,836! The error in multiplication is evident. The economic fallacy referred to consists in assuming that the cost of producing wheat was constant at $1.40 from 1921 to 1924, and that profit and loss figures for wheat producers as a whole can be determined on that basis.

The "widespread dissatisfaction which had culminated in the Farm Labor movement of 1924" is attributed (page 193) to "the decline in the price of wheat in the fall of 1923." The strength of the Farm Labor movement was greatest in the spring wheat belt. The trend of the prices received by farmers in this region for their wheat is typified best in the cash price of No. 1 northern spring wheat on the Minneapolis market. The price of No. 1 northern spring wheat during the two-year period from August, 1922, to September, 1924, was unusually constant, fluctuating within narrow limits close to $1.21½ per bushel. The maximum decline was to $1.12 in July, 1923, but in the fall months instead of "declining" the price rose to an average of $1.20 for the months of September and October. The average price for the year was $1.21. The price during September and October, two of the most important fall months, was therefore only one cent below the average price for the year. It is obviously erroneous, therefore, to attribute the Farm Labor movement of 1924 to "the decline in the price of wheat in the fall of 1923."

Occasional minor errors detract from the book. "The Berlin and Milan decrees of Napoleon, and the English Orders in Council" are said (page 133) to have "resulted in the Embargo Act of *1907*." (Italics are the reviewer's.) The name of Representative O. B. Burtness, who is quoted at length (page 147), is misspelled.

One also finds it difficult to agree with President Bizzell's statements that "The plantation system was distinctly feudal" (page 98); that "The problems of the pioneer farmer were not essentially economic" (page 119); and that "The forty-year period immediately preceding the World War was not characterized by very much constructive agrarian legislation in Europe" (page 73).

On page 229 it is said that "A good standard of living for those who live in the open country is the only means of saving the American farmer from peasantry." Isn't it more appropriate to say that the American farmer can have a good standard of living by refusing to become a peasant?

The difficult task of presenting a satisfactory interpretation of agrarianism still remains to be accomplished.

Millard Peck.

Kansas State Agricultural College

Farm Population of the United States, by Leon E. Truesdell, Washington; Government Printing Office, 1927. 536 pp. (census monograph VI.)

This monograph marks an era in our national population statistics. It is a recognition of two facts: namely, on the one hand, a changing arrangement and composition of population elements; on the other hand, a demand for a specific description of the agricultural population. Dr. G. F. Warren, in the Foreword to the volume states these two facts as follows:

"When the early censuses were taken in the United States, the Nation was so largely rural that interest centered in the growth of cities. Village and farm population was taken for granted. The early censuses, therefore, separated out the city population and left the remaining unsorted population together. At one time, the farm, city, and village populations were much alike, but today material differences have developed. So many differences exist that many persons have desired an analysis of the farm population."

One can hardly exaggerate the importance of these two facts as throwing light on the problem of agriculture. The social and economic forces working between agriculture and industry are sorting and restratifying our population structure. And the determination to understand better what is going on before our eyes is back of the popular demand for an accurate analysis and description of the population elements involved.

Mr. Truesdell in his monograph has made a pioneer effort, in a sympathetic temper, at interpretation of the economic forces that have been at work from 1790 to 1920 modifying the agricultural population.

Starting with a general survey of agriculture in America as set over against a growing industry in cities, he guides the reader through the census figures of rural and urban population from early times to the present. Out of this discussion comes the new statistical concept, "farm population," its use in the 1920 census, and the tabulation by states according to sex, age, race, occupation.

Mr. Truesdell brings to the surface a new possible census concept, "village population." This suggests the value of a clarified description of the village population elements, as in line with the value of the farm population element. We know all too little what function the village plays in American national life and economics. Welcome should be given henceforth to statistical information on village elements.

The rather scanty set of tables which appeared as Chapter XIV, in Volume V, of the Fourteenth Census Reports, showing by states the Composition of the Farm Population as of the date January 1, 1920, is very much augmented in Mr. Truesdell's monograph. Among these added tables should be mentioned especially a table giving by states a carefully estimated farm population for 1910; a table on population (rural and urban), number of farms, farm acreage all land and improved land, for the United States, year by year from 1850 to 1920; farm population, village population, urban population, by race, nativity

and parentage, for sections of the United States; a table of foreign-born white farm operators by country of birth, by states, for 1920; several tables on persons engaged in agricultural occupations.

The last 218 pages of the monograph are given to a detailed tabulation of the farm population of eight selected counties for the year 1920, made by the Division of Farm Population and Rural Life, Bureau of Agricultural Economics, from the 1920 census schedules. The counties are Dane, Wisconsin; Otsego, New York; Wake, North Carolina; Ellis, Texas; Scott and New Madrid, Missouri; Cass, North Dakota; King, Washington. This set of tabulations, on account of the great cost, will probably never be duplicated again for any county in such minute detail. The eight-county report for 1920, therefore, occupies a rather unique place historically in the development of the farm population statistical concept. A close perusal of these tables will make a good study approach to a sociological and an economic understanding of the farm population elements as they exist in the United States today.

The place of farm population as an economic factor in agriculture—a concept somewhat different from farm population as a sociological factor—is just now being vaguely apprehended. The man-power factor, as already conceived in agricultural economics, is still a different factor. No text-book on agricultural economics has yet essayed the meticulous placement of the farm population factor in the agricultural problem.

From this point of view, Mr. Truesdell's pioneer monograph will prove a stimulus to every farm economist.

C. J. Galpin.

Bureau of Agricultural Economics.

RECENT PUBLICATIONS

Compiled by Mary F. Carpenter, Library, Bureau of Agricultural Economics, U. S. Department of Agriculture

CALIFORNIA.

Adams, R. L. Cost of producing almonds in California. A progress report. (Calif. Agr. Exp. Sta. Bul. 422. 1927)

"Costs as figured do not include charges for management, use of operating capital, depreciation of trees, or interest on investment in orchard (land or trees)."

California. Dept. of agriculture. Monthly bulletin, v. 16, no. 4, April, 1927. Partial contents:—

How our fresh asparagus goes to market, p. 239-248. Contains a number of interesting illustrations.

Bureau of fruit and vegetable standardization. Enforcement activities; apple inspection, p. 252-254.

Federal-state agricultural statistics. Summary of April 1, crop conditions, p. 257.

Rauchenstein, E. Economic aspects of the cantaloupe industry. (Calif. Agr. Exp. Sta. Bul. 419. 1927)

"Those factors which affect prices of Imperial Valley cantaloupes and the effect of prices on subsequent acreage are analyzed in considerable detail."

Wilson, J. F. Wool production in California. (Calif. Univ. Col. of Agr. Agr. Ext. Serv. Circ. 12. 1927)

Some of the phases covered are factors affecting wool values, wool grading and wool sorting, the preparation of wool for market, and wool marketing. There is also a glossary of wool terms.

COLORADO.

Moorhouse, L. A., Burdick, R. T., and Hutson, J. B. Factors that influence profits on irrigated farms. (Colo. Agr. Exp. Sta. Bul. 318. 1927)

The authors have summarized the contents of this bulletin as follows: "First, a brief summary is given of the agricultural development of the irrigated section of Northern Colorado, of which the farms studied in Weld County are typical in many respects. Second, data showing the financial returns obtained on these farms are shown and the reasons for the variations in returns are discussed. . . .Third, the details of a few systems of farming that were unusually profitable during the years of the study are presented." The years covered in the study are 1922-1925. Work is being continued in this area during 1926 and 1927.

CONNECTICUT.

Connecticut. Agricultural college. Extension service. Biennial report 1925-1926. (Ext. Bul. 106. 1927)

Includes an account of what has been done in making studies of business records of farms, and the aims of the program in marketing and economics.

DELAWARE.

Benner, C. L., and Gabriel, H. S. Marketing of Delaware eggs. (Del. Agr. Exp. Sta. Bul. 150. 1927)

GEORGIA.

Georgia. State college of agriculture. Extension division. A survey of livestock production in Georgia. (Bul. 331. 1927)

"A preliminary report of a state livestock survey and contains summaries of incomes, analyses of costs, and other factors in livestock production."

Georgia. State college of agriculture. Extension division. Some facts about cotton prices. (Circ. 127. 1927)

A four-page leaflet.

INDIANA.

Purdue University. Agricultural experiment station cooperating with U. S. Dept. of Agriculture. Division of crop and livestock estimates. Indiana crops and livestock . . . Annual crop summary. 1926.

Purdue University. Agricultural experiment station cooperating with U. S. Dept. of Agriculture. Division of crop and livestock estimates. Indiana crops and livestock . . . Annual livestock summary. [1926.]

Young, E. C., and Hobson, L. G. Costs and profits in producing soybeans in Indiana. (Ind. Agr. Exp. Sta. Bul. 306. 1926)

KENTUCKY.

Hutson, J. B., and Finn, W. G. Man labor, horse work and materials used in producing crops in Christian county. (Ky. Agr. Exp. Sta. Bul. 274. 1926)

The crops covered are tobacco, corn, wheat and hay.

MAINE.

Merchant, C. H. An economic survey of the apple industry in Maine. (Me. Agr. Exp. Sta. Bul. 339. 1927)

Merchant, C. H. Maine agriculture. A statistical presentation. (Me. Agr. Exp. Sta. Bul. 338. 1927)

Based upon the Federal Census of 1925 but some of the items have been tabulated by towns (townships)

MARYLAND.

Maryland University. Extension service. Twelfth annual report . . . 1926.

Report on rural organization and marketing, p. 58-68.

MASSACHUSETTS.

Yount, H. W. Farm taxes and assessments in Massachusetts. (Mass. Agr. Exp. Sta. Bul. 235. 1927)

"The increasing cost of government brings about a two-fold tax problem: first, equable distribution of the tax burden; second, getting value received for tax money spent. This bulletin concerns itself primarily with the former phase of the problem, particularly as represented by assessment practices in different towns. The second part of the problem will be dealt with in a later publication."

MINNESOTA.

Minnesota. State dept. of agriculture. Minnesota annual crop and livestock statistics, 1925-1926. (Bul. 55. 1927)

Pond, G. A. A study of dairy farm organization in Southeastern Minnesota. (Minn. Agr. Exp. Sta. Tech. Bul. 44. 1926)

MISSISSIPPI.

Mississippi. Agricultural and mechanical college. Agricultural extension department. The farming situation in Mississippi. (Ext. Circ. 50. 1926)

MONTANA.

Barger, J. W. Cooperative markets for farm home products. (Mont. Col. of Agr. and Mech. Arts. Ext. Serv. Circ. 82. 1927)

Montana. College of agriculture and mechanic arts. Extension service. Agricultural outlook for 1927. March, 1927.

Montana. Dept. of agriculture, labor and industry. Division of publicity. Montana, v. 1, no. 6, April, 1927.

This is the farm review for 1926 which contains the annual statistics for crops, livestock, and farms with some special features.

NEW JERSEY.

Fenton, J. M. A financial survey of New Jersey agriculture. (N. J. Dept.. of Agriculture. Circ. 109. 1927)

New Jersey. Dept. of Agriculture. The State potato association and the State alfalfa association agricultural week, January 11-14, 1927. (Bul. 51, 1927)

Two of the addresses given during this week were New Jersey's Place in the Potato Market, by E. R. Biddle, p. 77-83, and How to Make and Lose Money at the Dairy Business, by A. G. Waller, p. 112-115.

NORTH CAROLINA.

North Carolina. Agricultural experiment station. Forty-ninth annual report . . . 1926.

Some of the research work in progress is as follows:

Farm organization and management studies; study of cotton gins; study of land prices; study of the standard of living of 1,000

farm families; study of the membership problems of cooperative marketing associations.

North Carolina. State college of agriculture and engineering. Agricultural extension service. Farm program for North Carolina, 1927. (Ext. folder 24. 1926)

NORTH DAKOTA.

Benton, A. H., and Peightal, M. F. Farmers' elevators in North Dakota; organization, operating methods, incomes, and costs. (N. Dak. Agr. Exp. Sta. Bul. 206. 1927)

"A field study was made and usable records secured from 223 farmers' elevators for the business year ending in the spring or summer of 1924." From this group 422 annual audit reports were secured for various years.

OHIO.

Ohio. Agricultural experiment station. Bimonthly bulletin, v. 12, no. 2, March-April, 1927.

Partial contents:—

Morison, F. L. Cost of farm real estate maintenance, p. 60-61.

Barnes, E. E. Trend of fertilizer sales in Ohio, p. 61.

OKLAHOMA.

Oklahoma. Agricultural and mechanical college. Extension division. What type of farming is most profitable? (Cir. 234. 1927)

Some of the results of a survey of farm business made by the Department of agricultural economics of the college.

Oklahoma. Agricultural and mechanical college. Extension division. A suggested system for Oklahoma cotton farms. (Cir. 233. 1927)

Suggests "what uses may be made of the 1,200,000 acres of Oklahoma land that grew cotton in 1926 but should not grow cotton in 1927." Some farm plans are given that have been worked out for farms of different sizes and different conditions.

OREGON.

Brown, W. S. The cranberry in Oregon. (Oreg. Agr. Exp. Sta. Bul. 225. 1927)

A table showing the cost of bringing into bearing is given on page 15, and on pages 29-30 there are a few paragraphs on the preparation for market and on marketing.

PENNSYLVANIA.

Bartlett, R. W. Milk marketing in Pennsylvania. (Pa. Agr. Exp. Sta. Bul. 208. 1926)

"This study attempts to analyze some of the past and present production and marketing practices in Pennsylvania and to determine some basic economic principles for marketing milk." A presentation is made of the milk marketing plans in the New York, Pittsburgh, Philadelphia and Connecticut markets.

TEXAS.

Lee, V. P. Short-term farm credit in Texas. (Texas. Agr. Exp. Sta. Bul. 351. 1927)

"Contains analysis of information . . . received from 455 farmers, 52 bankers, and 279 merchants."

Texas. Agricultural experiment station. Thirty-ninth annual report, 1926. On pages 48-52 a list of eleven projects in farm and ranch economics is given with the status of each.

Texas. Agricultural and mechanical college. Extension service. A safer farming program for Texas. (1927)

Last year's bulletin on the subject had the title "Suggested safe farming program for Texas."

VIRGINIA.

Brodell, A. P. Cost of producing Virginia dark and bright tobacco and incomes from farming, 1922-1925. (Va. Agr. Exp. Sta. Bul. 255. 1927)

Virginia. Dept. of agriculture. Division of agricultural statistics. Virginia farm statistics, 1926. (Bul. 4. 1927)

Compiled jointly by the U. S. Dept. of Agriculture and Va. Dept. of Agriculture. Division of Agricultural Statistics.

WISCONSIN.

Hibbard, B. H., and Howe, Harold. Farm lease in Wisconsin. (Wis. Agr. Exp. Sta. Bul. 391. 1927)

Hibbard, B. H., and Allin, B. W. Tax burdens compared. (Wis. Agr. Exp. Sta. Bul. 393. 1927)

This study shows "how the increased tax burdens of the past decade have fallen relatively upon the farm, city, and village classes respectively." It "deals with personal incomes and taxes, but does not include corporation incomes and taxes."

Macklin, Theodore, and Schaars, M. A. Cooperative sales organization for livestock. (Wis. Agr. Exp. Sta. Bul. 394. 1927)

PUBLICATIONS OF THE BUREAU OF AGRICULTURAL ECONOMICS

Issued April 16, June 30, 1927.

DEPARTMENT BULLETINS.

1464. Market classes and grades of cattle, by Don J. Slater. Describes the classes and grades of cattle used by the Bureau in its livestock market-reporting service. Well illustrated.

1470. Market classes and grades of dressed lamb and mutton, by W. C. Davis and J. A. Burgess. "The descriptions of grades of lamb and mutton appearing in this bulletin are not new to the meat industry. To a large extent they represent the centralization and unification of ideas and methods of a large majority of representative slaughterers and wholesale and retail meat dealers throughout the United States . . . . . Already buying and selling in distant markets have been simplified to a market degree." Eighteen plates.

1471. Oil content of flaxseed, with comparisons of tests for determining oil content, by D. A. Coleman and H. C. Fellows. Flaxseed in this country depends for its value largely on its oil content, and because of the difficulty of exact chemical analysis physical factors were depended upon in the trade to indicate values of different lots of seed. This bulletin points out the rather unsatisfactory results of physical tests as grading factors compared with chemical analysis, and describes a method of making in twelve minutes or less a chemical analysis of accuracy sufficient for commercial purposes.

1488. Manufacturing tests of cotton of the white grades of the Universal Standards for American cotton, by Horace H. Willis. A description of spinning tests conducted to determine the relative intrinsic value of each of the nine white grades of American upland cotton as represented by the universal standards for American cotton. Technical, but interesting to those who have watched the movements of cotton prices and wondered how much difference there really is between grades.

DEPARTMENT CIRCULARS.

410. United States standards for honey, by E. L. Sechrist. Besides giving the standards, this circular tells how to grade honey.

420. The peach situation in the southern States, by M. R. Cooper, and J. W. Park. Facts and figures on the development of peach growing, varieties, marketing and prices to growers. With so many young trees set but not in full bearing the potential increase in production is such as to give any but the unthinking or the incorrigible optimist cause for some sleepless nights unless he is advantageously situated.

MISCELLANEOUS CIRCULAR.

413. Extent and causes of rejection of northwestern boxed apples, by R. R. Pailthorp and J. W. Park. Cars of fruit are rejected at markets for various reasons, physical and economic, applying with different force in different seasons.

STATISTICAL BULLETINS.

15. Prices of farm products received by producers. 2 The North Central States. Monthly prices through 1925, and other data by States, with comparable data for other years.

17. Prices of farm products received by producers. 4 The Western States. Both of these are of the series of bulletins presenting the farm price data of the Department by States. Number 16 completing the series is still in press.

UNNUMBERED PUBLICATIONS.

Annual livestock market review, 1926, by H. M. Conway. This is one of a series of summaries of the livestock markets previously issued in mimeographed form which has been given a cordial reception by the trade. It is "designed (1) to give a perspective of conditions in the livestock industry as exemplified in the public markets during 1926, (2) to emphasize seasonal variations and the general trend during the year . . . . (3) to interpret the situation in general, and (4) to indicate some of the probabilities of the future."

Harvesting wheat with a combined harvester-thresher in the Great Plains region 1926, by R. S. Kifer, W. R. Humphries, and J. H. Martin. Observations of the use, performance and costs of operating these machines, which have already made a deep impression on farmers who have large acreages of grain to cut.

In April the U. S. Department of Agriculture announced a change in the designations of certain series of publications "in the interest of greater clearness and definiteness." "Department Bulletins" are discontinued as such with No. 1500, after which bulletins of that type will be called "Technical Bulletins." Other new designations are "Circular" replacing the Department Circular at No. 425, and "Miscellaneous Publication," replacing the Miscellaneous Circular series at No. 110.

The reserve supply of the April, 1926, issue of the Journal (vol. 8, no. 2) is exhausted. The secretary has calls for a few copies of that issue for completing library files. He will appreciate hearing from anyone who is willing to part with his copy at $1.25. Communicate with Dr. W. I. Myers, Cornell University, Ithaca, New York.

NOTES

Committee on Research

For some time the American Farm Economic Association has felt the need of taking stock of the work being done in the field of agricultural economics. With the increasing amount of work being done, and especially during the past two years with the stimulus and the responsibilities put by the Purnell Act on agricultural experiment station workers in agricultural economics, this need has seemed all the more urgent. The Farm Economics Association has for some time annually appointed a Committee on Research, but this Committee, while functioning each year, has been handicapped by lack of funds with which to make an intensive or even extensive survey of the work in progress and the methods in research which are proving useful.

The Social Science Research Council being aware of the increasing amount of research work in progress in agricultural economics and rural sociology and having seen the apparent need, made a small appropriation in 1926 with which to carry forward such a study as the Farm Economic Association and the Rural Sociology groups had in mind. The Farm Economic Association at its annual meeting in St. Louis, upon the recommendation of its research committee, voted to cooperate with the Social Science Research Council in carrying out the survey as it related to Agricultural Economics.

Representatives of the two groups met in Chicago on May 2nd to 4th, to draw up plans for the study. Those present were J. D. Black, T. P. Cooper, Joseph S. Davis, L. C. Gray, E. G. Nourse, H. E. Erdman, J. I. Falconer, G. W. Forster, W. E. Grimes, J. D. Pope, H. C. Taylor and G. F. Warren. The latter seven will participate in the field work. It having been decided in carrying out the survey to visit all points in the United States, so far as possible where research work in agricultural economics is being carried on, including agricultural colleges and experiment stations, other state and federal agencies, privately endowed institutions, and all other agencies, carrying on research in these fields with the public welfare in view. Some of the field workers started out imme-

diately at the close of the Chicago meeting and it was hoped that all the field work would be done by July 15th. Having in mind the object of the survey which is to bring about a clearer understanding of the scope of agricultural economics and to bring together the best information available regarding research methods, data will be secured from each institution relating to research projects in progress, the methods employed and the retrospect of workers relating to projects and methods. The cooperation of all is solicited.

The accumulated data and information will then be worked over by the Committee, and a preliminary report made at the annual meeting of the Social Science Research Council in August. At the annual meeting of the Farm Economics Association this coming winter a full day or more will be given over to reports and discussion relating to various phases of the study, and possibly to plan for carrying the study still further.

Agriculture at Geneva

Agriculture shared with commerce and industry in the program of the World Economic Conference held at Geneva, May, 1927, under the auspices of the League of Nations. The object of the conference was to promote not only the prosperity but also the peace of the world. Fifty countries were represented. Several of the countries had special agricultural representatives. In preparing for the conference and in its development it was recognized that more than half of the population of the world is engaged in agricultural production, that the quantity of foodstuffs and raw materials produced in agriculture is one important factor in determining the maximum limit of the industrial development, and that agricultural purchasing power is important to industry. It was recognized also that the interdependence between nations is no less close in relation to agriculture than in relation to industry or commerce. The President of the Conference, Thenuis, Belgium, in closing the conference remarked that for the first time, at this conference, agriculture has been represented side by side with commerce and industry, in such a way that it can take its place

in a general review of the economic situation of the world.

The results of the conference are not very definite and are difficult to appraise. In such an international conference it is difficult to formulate definite ideas or suggest specific remedies. There are but few points, and they are very general, upon which all countries can agree. The resolutions are binding upon no one. There is no official agency authorized to put into effect any of these resolutions. In organizing the Conference it was announced that countries participating were not to be found by any vote or act of the Conference. The promoters, however, expected and hoped that there would be some crystallization of thought and development of ideas that would be useful to the League of Nations and to individual countries who are struggling with many economic and political problems.

The Conference found that agriculture in a large number of countries is depressed in varying degrees and that this depression is characterized by a "disequilibrium" of prices of agricultural products with those of manufactured products. The Conference expressed the opinion that, if practical measures are not taken to restore the price equilibrium, sooner or later there will be a diminution in agricultural production detrimental to the welfare of mankind.

It does not appear that any attempt was made to explain the "disequilibrium" between the prices of agricultural products and those of industry. It had been shown in documents submitted and noted in the introduction of the resolutions that world production of foodstuffs and of raw materials was from 16 to 18 per cent greater in 1925 than in 1913, whereas population was only about 5 per cent greater. There is, however, no suggestion of checking the rate of increased production, or adjusting production to demand as a means of restoring the price equilibrium. It is noted that technical means exist for a considerable development of agriculture, and they must, therefore, be put into operation. It is further stated that the Conference regards as a vital economic question, "the increase of agricultural production," and in the same sentence, "the placing of agriculture on an equal footing with industry by enabling all those engaged in agriculture to obtain a satisfactory living, a normal return for their labor and on their capi-

tal." This is an ideal generalization. It is followed by an equally ideal laissez-faire doctrine that: "The improvement of agriculture must in the first place be a work of the agriculturists themselves." It is explained that the general adoption of technical improvements and the scientific organization of production and marketing will permit agriculturists to reduce their cost of production in their own interest and to the benefit of consumers. The theory upon which the agricultural resolutions are based appears, therefore, to be that agriculture is depressed because prices of agricultural products are too low as compared with prices of industrial products and the remedy is to produce more, but do it more scientifically, and market the product more scientifically, so as to reduce the cost to producer and consumer.

Resolutions of the Conference dealt with agricultural cooperations, agricultural credit, plant and animal diseases, colonies, forestry, and statistics. These resolutions may be briefly summarized as follows: All forms of cooperation should be promoted among producers. Direct relations should be developed between consumers' cooperative societies and producers' cooperative societies. The Conference suggests that international agreements between cooperative organizations might be of value in placing markets on a sound basis, in regularizing production, and stabilizing prices from the point of view of the balance between production and consumption. Here the conference came near to suggesting some control of production, but this seems to be only a timid suggestion that cooperative producers might imitate industrial cartels. A committee representing national and international cooperative organizations of agriculturalists and consumers should be established to promote research and otherwise aid in the general development of cooperation.

The League of Nations is requested to examine further the possibility of international action in respect to agricultural credit with a view of promoting recovery of agriculture where agriculture is short of capital.

International campaigns against the diseases affecting plants and animals are advised. A special study of forestry in order to assure the regular satisfaction of the needs of industry, and an investigation of the best means of encourag-

ing agriculture in the tropical and sub-tropical colonies are recommended.

To provide a better basis for a complete analysis of the economic problems of agriculture, the Conference recommends that in the different countries "an exact system of farm accounting should be formulated;" endorsed the taking of the world agricultural census, the speedy transmission to agriculturalists of information on harvests, stocks, consumption, and movements of different commodities and the monthly publication of indices of the comparative prices of agricultural products and industrial products; and requested governments to initiate general inquiry into economic, social, financial and technical conditions of agriculture as a basis for further progress.

The Conference recognizes that governments can be a factor in the agricultural situation and the following are two of the most interesting resolutions passed by the Conference:

(1) "It is desirable that all hindrances to the free circulation of and trade in agricultural products should be removed, in so far as their removal does not endanger the vital interests of the different countries and their workers."

From the European point of view this is directed toward our quarantine regulations on the importation of certain agricultural products. It is assumed by many European countries that these regulations on our part are economic protection in disguise. However, the phrase "vital interests of the different countries and their workers" leaves us in the same position as before the Conference.

(2) "In those States in which Customs protection is maintained, it should be reduced, both for industry and agriculture, to the lowest possible indispensable to production; care should be taken to assist in the maintenance of an equitable balance between industry and agriculture and not to stifle one to the advantage of the other."

This resolution is in line with others asking governments to equalize opportunities or privileges and burdens between agriculture and industry.

Western Society of Farm Economists

At Reno, Nevada, June 22 and 23, a group of agricultural economists in the Western States met for the discussion of problems common to them, looking toward closer coordination of the work in agricultural economics in that part of the country. Most of those in attendance are members of the American Farm Economic Association, but feel a need for the additional benefits that a regional organization will provide. Several technical papers were read and outlines of projects in agricultural economics were discussed. A permanent organization was effected with Professor F. B. Headley, University of Nevada, as President, Professor H. D. Scudder, Oregon Agricultural College, as Vice-President, and Professor C. V. Carden, Utah Agricultural College, as Secretary.

The International Institute of Agriculture at Rome is prepared to receive applications for positions of persons qualified in tropical agriculture, rural economics, trade in agricultural products, dairy science, plant diseases, and in general academic subjects. Apparently seven positions are open. Appointments will be made as a result of examination of the qualifications of the candidates, in which account will be taken of their knowledge of languages. The minimum initial emoluments are 22,750 liras per year (about $1,150) plus travelling expenses to the post of duty, and travel to native country once every three years. Applications should be addressed to the Bureau du Personnel, Institut International d'Agriculture, Villa Borghese, Rome, and must be received not later than August 31, 1927.

Changes in address should be sent to the Secretary of the association (Dr. W. I. Myers, Cornell University, Ithaca, N. Y.) on or before the tenth day of the month of publication, in order to save delay and loss. The Journal goes to the last address of record in the Secretary's office, and, as second-class mail, it is not forwarded by the Post Office without additional postage supplied by some one. In the process of following up persons who move, delay is inevitable and many Journals are lost. The cooperation of members and subscribers is earnestly solicited to the end that such difficulty may be reduced to a minimum.

CANDIDATES FOR THE DOCTOR'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES

The name shown in parenthesis is that of the university at which the degree is sought. The date indicates the probable time of completion.

Aberle, John A.—B.S., Southern California, 1920; M.S., Detroit, 1923; "A System of Financing Real Estate Investments." (Michigan, 1928.)

Allin, B. W.—B.S., Wisconsin, 1921; "Tax Burdens Compared, Farm, City and Village in Dane County, Wisconsin." (Wisconsin, 1927.)

Alvord, Ben F.—B.S., Illinois, 1923; M.S., Illinois, 1924; "Shifts in Agricultural Production in the Red River Valley in Minnesota." (Minnesota, 1927.)

Anderson, R. H.—B.S., Illinois, 1923; M.A., Illinois, 1925; "History of Agriculture in Illinois during the Civil War." (Illinois, 1928.)

Ballinger, Roy A.—B.S., Minnesota, 1924; M.A., Minnesota, 1925; "The Taxation of Agriculture in Minnesota. (Minnesota, 1928.)

Bartlett, Roland W.—B.S., Cornell, 1922; M.S., Cornell, 1924; "A Study of Milk Marketing in Pennsylvania." (Pennsylvania State, 1928.)

Bennett, Merrill K.—Ph.B., Brown, 1920; A.M., Brown, 1921; A.M., Harvard, 1926; "American Statistics of Farm Costs; Their Development and Significance." (Stanford, 1927.)

Beyleveld, Abraham J.—B. of Com., Stellenbosch; (Not determined.) (Cornell)

Black, Albert G.—B.S., Illinois, 1920; M.A., Minnesota, 1925; "Wealth and Income of the Farmers of the United States." (Minnesota, 1927.)

Bond, Maurice C.—B.S.A., Vermont, 1920; M.S., Vermont, 1926; "A Study of the the Marketing of Milk Through Ice Cream." (Cornell, 1928.)

Boyd, Howard B.—B.S., Saskatchewan, 1923; (Not determined.) (Cornell, 1929.)

Brookins, Perley F.—A.B., South Dakota, 1917; "Foreign Competition in the Dairy Industry of the United States." (Maryland, 1927.)

Brown, C. A.—B.S., Purdue, 1917; M.S., Purdue, 1921; "Cooperation in Marketing of Dairy Products in Illinois." (Illinois, 1929.)

Bucknam, Roland F.—B. S., Cornell, 1914; "An Economic Study of Farm Electrification." (Cornell, 1930.)

Cairns, Andrew—B.A., Alberta, 1923; M.S., Minnesota, 1927; "A Comparative Study of Grain Marketing in the United States and Canada." (Minnesota, 1928.)

Call, Irving J.—B.S., Cornell, 1922; "Farm Property Taxation in New York." (Cornell, 1927.)

Churchill, Omar O.—B.S., Michigan Agricultural College, 1906; M.S., North Dakota, 1923; "The Economics of Flaxseed Production in the United States." (Minnesota, 1927.)

Cowan, Donald R.—B.A., Queen's University, 1917; M.A., Toronto, 1918; "An Analysis of the Factors Determining the Territorial Distribution of the Sale of Dairy Produce." (Minnesota, 1928.)

Crosby, Allan W.—B.S., Cornell, 1926; (Not determined.) (Cornell, 1930.)

du Plessis, Jan H.—A.B., Transvaal, 1925; (Not determined.) (Cornell, 1929.)

Ellsworth, Von T.—B.S., Utah, 1924; M.S., Utah, 1924; "The Distribution of Control in California Cooperative Marketing Associations." (University of California, 1928.)

Foster, Robert G.—B.S., New Mexico, 1919; (Not determined.) (Cornell, 1929.)

Gilbert, Clifford W.—B.S., Cornell, 1916; M.S., Cornell, 1926; "Cost of Operating Tractors and Effects of Tractors on Farms." (Cornell, 1928.)

Gile, Bueford M.—B.S., Wisconsin, 1913; M.A., Minnesota, 1925; "The Agricultural Credit Situation in Minnesota." (Minnesota, 1927.)

Graue, Erwin—B.S., Cornell, 1923; "The Balance of Agriculture and Manufacturing Enterprise." (Cornell, 1928.)

Grindley, Thomas W.—B.A., University of Alberta, 1923; B.S., Minnesota, 1925; M.A., Minnesota, 1927; "The Effects of Single-crop Agriculture in Western Canada." (Minnesota, 1927.)

Hamilton, Henry G.—B.S.A., Florida, 1921; "The Cost of Handling Citrus Fruit." (Cornell, 1927.)

Hammar, Conrad H.—B.S., Minnesota, 1924; "The Valuation of the Cutover Land of the Lake States." (Minnesota, 1927.)

Hartman, S. C.—B.S., Ohio, 1910; M.S., Ohio, 1912; "The Development and Status of the Trucking Business in the Muskingum Valley." (Ohio, 1927.)

Hartman, W. A.—B.S., Wisconsin, 1923; M.S., Wisconsin, 1924; "Grub Stake Settlement in Northern Wisconsin." (Wisconsin, 1927.)

Hathcock, James S.—B.S., North Carolina, 1918; M.S., Cornell, 1923; "Practices and Costs of Cotton Gin Operation in North Central Texas." (Cornell, 1927.)

Hendel, Julius—B.A., Cornell 1921; "Cash and Future Price of Wheat in the Minneapolis Market for Hard Spring Wheat." (Minnesota, 1927.)

Hill, Forrest F.—B.S., Saskatchewan, 1923; "An Economic Study of the Problems of Making Farm Loans." (Cornell, 1927.)

Hinrichs, Arnold F.—B.S., Minnesota, 1922; "A Study of the Economic Factors Producing Differences in the Organization of German Agriculture and the Agriculture of Those Parts of the United States Having Similar Climatic Conditions." (Minnesota, 1928.)

Holloway, Keith L.—B.S., Arkansas, 1924; M.S., Arkansas, 1924; (Not determined.) (Cornell, 1930.)

Holt, Budd A.—B.A., Minnesota, 1920; M.A., Minnesota, 1922; "Analysis of Potato Price Differentials." (Minnesota, 1927.)

Hurd, Edward Blake—M.A., Minnesota, 1923; "Economics of Farming Types in Iowa with Reference to Historical Geographical and Personal Factors." (Iowa, 1929.)

Jensen, Ward C.—M.S., Wisconsin, 1920; "Farm Organization and Cost of Production on Cotton Farms in Anderson County, South Carolina." (Wisconsin, 1927.)

Johnson, Abner L.—B.A., Hamline, 1918; M.A., Minnesota, 1924; "The Incidence of Marketing Costs." (Minnesota, 1928.)

Johnson, Edwin C.—B.A., Minnesota, 1921; M.A., Minnesota, 1923; "An Analysis of the Agricultural Audit Situation in Kentucky." (Minnesota, 1928.)

Johnson, Oliver R.—B.S.A., Missouri, 1910; "The Incidence of Costs as Determining the Equitableness of Rent Agreements." (Cornell, 1929.)

Lindsey, Adrian H.—M.S., Iowa State College, 1922; "Causes of the Growth of Land Value in Iowa." (Iowa,)

Lininger, Frederick F.—B.S., Pennsylvania State, 1917; M.S., Cornell, 1926; "Marketing of Pennsylvania Apples." (Cornell, 1928.)

McBride, Charles G.—B.S., Pennsylvania State, 1911; M.S., Cornell, 1922; "An Economic Study of Market Milk Areas in Eastern Ohio." (Cornell, 1927.)

McCord, John L.—B.S., Pennsylvania State, 1915; M.S., Cornell, 1920; "Farm Leases for Pennsylvania Conditions." (Cornell, 1928.)

Meal, Wm. G.—B.S., Cornell, 1923; "Production and Marketing Study of New York Lettuce." (Cornell, 1929.)

Mereness, Elmer Hiram—B.S., Cornell, 1926; (Not determined.) (Cornell,)

Metzger, Hutzel—B.S., North Dakota, 1920; M.A., North Dakota, 1923; "The Economic Aspects of Local Grain Elevator Organization." (Minnesota, 1926.)

Murray, Keith A. H.—B.S., Edinburgh, 1925; "Some Aspects of Milk Marketing." (Cornell, 1928.)

Myers, Lawrence—B.A., Minnesota, 1922; M.S., Iowa State College, 1923; "Economics of Fertilizer Consumption with Special Reference to the Cotton Crop." (Minnesota, 1928.)

Neethling, Johann C.—A.B., Transvaal, 1922; "An Economic Study of Dairy Farming in Chenango and Madison Counties." (Cornell, 1928.)

Patton, Harold S.—A. B., Toronto, 1912; "Grain Growers Cooperation in Western Canada." (Harvard, 1927.)

Peterson, George M.—B.S., Minnesota, 1921; M.A., Minnesota, 1923; "The Problem of the Agricultural Surplus in the United States." (Minnesota, 1927.)

Pond, George A.—B.S., Minnesota, 1908; "A Study of Dairy Farm Organization in Southeastern Minnesota." (Cornell, 1927.)

Pope, James D.—B.S., Peabody College, 1918; M.S.A., Cornell, 1924; "The Price of Cotton." (Cornell, 1927.)

Powell, Whiton—A.B., Cornell, 1924; M.S., Cornell, 1925; "Efficiency of Operation of Retail Feed Stores." (Cornell, 1928.)

Rankin, John O.—"Socio-Economic Studies of Nebraska Farm Tenancy." (Wisconsin, 1927.)

Rauchenstein, Emil—B.S., Wisconsin, 1911; M.S., Illinois, 1924; "Factors Affecting the Supply of Fluid Milk in the Twin City Market Area." (Minnesota, 1926.)

Rhoades, Joseph—B.S., Minnesota, 1918; M.S., Minnesota, 1920; "Factors Affecting the Price of Beef Cattle." (Minnesota, 1928.)

Rowe, Harold B.—B.S., Iowa State College, 1923; "A Plan for Federating Farmers' Elevators in the Spring Wheat Area." (Minnesota, 1927.)

Rozman, David—B.A., Wisconsin, 1923; M.A., Wisconsin, 1926; "A Comparative Study of Land Tenure in Selected Foreign Countries and the United States." (Northwestern University, 1928-29.)

Shepherd, Geoffrey S.—B.S.A., Saskatchewan, 1924; M.S., Iowa, 1925; "The Problem of the Corn Surplus." (Harvard,)

Stephens, Philip H.—B.S., Nebraska, 1920; (Not determined) (Cornell,)

Stover, Howard J.—B.S., Cornell, 1926; (Not determined) (Cornell,)

Taylor, C. C.—B.S., 1917; M.S., 1923; A.M., 1925; "The Economic Philosophy of the Cooperative Form of Business Organization." (Harvard, 1927.)

Ten Haken, Wm. H.—B.A., Hope College, 1917; M.A., Wisconsin, 1924; "A Study of Land Ownership and Tenancy in Knox County, Illinois." (Illinois, 1928.)

Tennant, John L.—B.S., Toronto, 1913; M.S., Cornell, 1921; "The Economic Relationships between Roads and Agriculture." (Cornell, 1928.)

Timoshenko, Volodimir P.—Graduated from Dept. of Economics Polytechnic Institute, Petrograd, 1911; "Wheat Prices and World Wheat Market." (Cornell, 1927.)

Thurston, Mather F.—A.B., Cornell, 1909; "The Outlook for Market Hay in New York State." (Cornell, 1927.)

Tucker, Charles K.—B.S., Cornell, 1922; M.S., Cornell, 1925; "Country Milk Plants." (Cornell, 1927.)

Ulrey, Orion—B.S., Illinois, 1923; (Not determined) (Cornell,)

Vaughan, Lawrence M.—B.S., Cornell, 1923; "An Economic Study of the Utilization of Land." (Cornell, 1928.)

Vial, Edmund E.—B.S., Illinois, 1922; M.S., Cornell, 1924; "Prices of Fertilizer Materials and Factors Affecting the Fertilizer Tonnage." (Cornell, 1927.)

Walker, Wm. Paul—B.S., Maryland, 1921; M.S., Maryland, 1924; "Cost of Producing Canning Crops in Maryland." (Maryland, 1929.)

Walrath, Frank J.—B.S., Cornell, 1923; "A History of the Agriculture of Tompkins County. New York." (Cornell, 1927.)

Weeks, David—B.S., Nebraska, 1915; C.E., Nebraska, 1921; M.S., Iowa, 1919; "An Analysis of Factors Determining Land Prices in the Eleventh Federal Farm Loan District." (California, 1928.)

Wellman, Harry R.—B.S., Oregon, 1921; M.S., University of California, 1924; "An Analysis of the Methods of Poooling Employed by the Cooperative Fruit Marketing Associations in California." (California, 1927.)

Wertz, Virgil R.—M.S., Wisconsin, 1920; "Some Physical and Economic Aspects of Potato Production in South Dakota." (Wisconsin, 1927.)

Wileden, Arthur F.—M.S., Wisconsin, 1925; "Study of Organization in Selected Rural Communities (1) Historically; (2) Attitudes; (3) Carrying Power." (Wisconsin,)

Wittwer, Eldon—B.S., Nevada, 1922; (Not determined.) (Cornell, 1929-30.)

Wright, Ivan—B.S., West Virginia, 1915; M.S., Michigan, 1917; "The Joint Stock Federal Farm Loan Banks." (Michigan, 1927.)

Young, Harold N.—B.S., Cornell, 1917; "An Economic Study of the Cost of Production and Marketing of Field Beans." (Cornell, 1931.)

Young, Harry P.—B.S., Pennsylvania State, 1913; "An Economic Study of Dairy Farming on 186 Farms in the Townships of Randolph and Royalton, Vermont." (Cornell, 1927.)

CANDIDATES FOR THE MASTER'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES

The name shown in parenthesis is that of the university at which the degree is sought. The date indicates the probable time of completion.

Anderson, Pearl E.—A.B., Cornell, 1924; (Not determined.) (Cornell,)

Anderson, S. A.—B.S., Illinois, 1927; "Investment and Cost of Farm Buildings, Machinery and Equipment." (Illinois, 1928.)

Arneson, Edgar—B.S., Wisconsin, 1925; "A Study of Livestock Shipping by Cooperative Elevators in Ohio." (Ohio, 1927.)

Atwood, Harry C.—B.S., Ohio, 1917; "Is Ohio Agriculturally Self-sufficing." (Ohio, 1927.)

Babson, John Low, Jr.,—"An Economic Study of 103 Apple Farms in Oxford County." (Maine, 1927.)

Ballentyne, Alando B.—B.S., Utah, 1927; "The Marketing of Arizona Lettuce." (Utah, 1928.)

Balmer, Frank E.—B.S., Kansas, "The Relation Between Land Values and Agricultural Prosperity in the United States." (Minnesota, 1928.)

Barber, James W.—B.S.A., Idaho, 1920; "An Economic Study of the History, Present Situation, and Outlook of Agriculture on the Minidoka Irrigation Project." (Joint author with J. T. Montgomery.) (Idaho, 1928.)

Bauman, Ronald H.—B.S., Purdue, 1923; "Economic Factors Affecting the Price of Sheep." (Purdue, 1927.)

Bell, Ellsworth W.—B.S., Pennsylvania State, 1926; "An Economic Study of Feeding Practices on 138 Cabot and Marshfield Farms." (Vermont, 1928.)

Bennett, Benj. H.—B.S., Maryland, 1926; "The Supply and Distribution of Fluid Milk on the Baltimore Market." (Maryland, 1927.)

Betts, Ronald E.—B.S., Oklahoma, 1926; "Some Factors Affecting the Acreage of Cotton in Oklahoma." (Oklahoma, 1927.)

Bivert, Raymond E.—B.S., Oklahoma, 1926; "Economic Resources in the Territory of the Orient Railway." (Oklahoma, 1927.)

Bodin, Roy—B.S., Minnesota. "A Survey and Analysis of the Existing Data Relative to the Farmer's Share in the Tax Burden." (Minnesota, 1927.)

Bottum, J. C.—B.S., South Dakota, 1926; "The Farm Power Problem in Illinois." (Illinois, 1927.)

Bradley, C. J.—B.S., West Kentucky Teachers College, 1926; B.S.A., Kentucky, 1926; "Western Kentucky Agriculture Since 1909." (Illinois, 1927.)

Bredin, James H.—B.S., Saskatchewan; "Price Differentials in Wheat Between Minneapolis and Winnipeg." (Minnesota, 1927.)

Brightman, Melvin H.—B.S., Rhode Island, 1920; "A Method of Studying Consumer Demand for Poultry Products." (Pennsylvania State College, 1927.)

Brooker, Marvin A.—B.S.A., Florida, 1926; "Farm Tenancy in Jackson County, Florida." (Florida, 1927.)

Class, Charles F.—B.S., Ohio, 1912; "The Radio: Its Use Among Ohio Farmers." (Ohio, 1927.)

Cole, Ralph H.—A.B., Nebraska, 1925; "Nebraska and the Great Lakes—Saint Lawrence Deep Waterway." (Nebraska, 1927.)

Cole, Ray M.—B.S., Pennsylvania State, 1920; "A Study of the Organizations Affecting Farm Youth in Chester County, Pennsylvania." (Pennsylvania State College, 1927.)

Cooper, John F.—B.S.A., Alabama Polytechnic Institute, 1921; "Cost of Growing Some Florida Crops." (Florida, 1929.)

Cox, Omar C.—B.S., "The Marketing of Eggs." (Virginia, 1927.)

Cunningham, L. C.—B.S., Illinois, 1926; "Some Economic Aspects of the Movement of Hogs to Market." (Illinois, 1927.)

Currie, John R.—B.S., Glasgow, 1925; "Hog Cycles in the United Kingdom and the United States." (Cornell, 1927.)

Dawson, Owen L.—B.S., Illinois, 1920; "A Consideration of Methods of Securing Historical Price and Production Data, and a Survey of their Relationships for South Dakota." (South Dakota, 1927.)

Day, Oscar A.—B.S., Purdue, 1925; "Indiana Farm Prices." (Purdue, 1927.)

Denlinger, Hubert E.—B.S., Ohio, 1923; "The Movement of Dairy Products Into and Out of the State of Ohio." (Ohio, 1927.)

De Swardt, S. J.—"Factors Affecting Success In Land Settlement in Union of South Africa." (Minnesota, 1927.)

Donaldson, David N.—B.S., Kansas, 1926; "The Causes of the Failure of the United States Grain Growers Incorporated." (Kansas, 1927.)

Dowler, John F.—B.S., Ohio, 1922; "The Costs of Producing Livestock in Greene County, Ohio." (Ohio, 1926.)

Durr, Roy F.—B.S., Ohio, 1926; "A History of Agricultural Prices in Ohio." (Ohio, 1928.)

Eckloff, Elmer—B.S., Minnesota; "Different Types of Price Quotations Used in the South St. Paul Livestock Market." (Minnesota, 1927.)

Epps, Martha S.—B.S., Massachusetts; "A Critical Examination of Available Income and Budget Data for Urban Groups (Considered Especially from the Point of View of Comparability with Similar Data for Rural Groups)." (Minnesota, 1927.)

Ewing, Marvin—"The Financing of Highway Construction and Maintenance." (Delaware, 1927.)

Foote, Nathaniel—B.S., Nebraska, 1926; "The Correlation of Production and Prices of Beef Cattle from 1867 to 1925." (Texas, A. and M. College, 1927.)

Foster, Ralph L.—B.S., Kansas, 1922; "A Study of Kansas City-Chicago Price Spreads for Cash Wheat." (Kansas, 1927.)

Froker, Rudolph—B.S., Minnesota, ; "The Economics of the Organization and Business Practices of the Cooperative Oil Companies in Minnesota." (Minnesota, 1927.)

Gans, Altha R.—B.S., Pennsylvania State, 1926; "Factors Affecting Average Deliveries of Milk per Patron at Vermont Plants." (Vermont, 1927.)

Garrett, G. E.—B.S., Texas, 1926; "Operating Capital for Cooperative Marketing Concerns." (Texas A. and M. College, 1927.)

Green, Wm. J.—B.S., Oklahoma, 1916; "Economics of Farm Terracing." (Oklahoma, 1928.)

Gregg, Walter E.—B.S., Ohio Northern University, 1906; "A Detailed Cost Study of Country Milk Shipping Plants." (Pennsylvania State College, 1927.)

Grinager, T.—B.S., Minnesota; "The Cooperative Marketing of Honey." (Minnesota, 1927.)

Grindley, Thomas W.—B.S.; B.A., Alberta; "The Economics of Oats Production in Western Canada." (Minnesota, 1927.)

Hall, John R.—B.S.A., Missouri, 1917; "An Analysis of Types of Farming in Lenn County, Missouri." (Missouri, 1928.)

Hardy, Leon D.—B.S., Utah, 1917; "Economic Phases of the Wool Industry of Utah." (Utah, 1928.)

Hauck, Charles W.—B.S., Ohio, 1920; "An Economic Study of the Ohio Apple Industry." (Ohio, 1927.)

Hembree, James F.—B.S., Texas, 1926; "The Relation of Cotton Acreage to Volume of Production." (Texas A. and M. College, 1927.)

Henney, Homer J.—B.S., Kansas, 1921; "Price Indices for Different Classes of Feeder and Fat Cattle." (Kansas, 1928.)

Hill, Elton B.—M.S., Michigan, 1915; "Study of Use of Building Space in the College of Agriculture." (Cornell, 1927.)

Hobson, Leo G.—B.S., Purdue, 1924; "An Economic Study of the Cost of Producing Soybeans in Indiana." (Purdue, 1927.)

Hopkins, E. C.—B.S., Illinois, 1917; "Speculation at the Livestock Market With Special Reference to Chicago." (Illinois, 1927.)

Hosking, Floyd J.—B.A., Minnesota, 1925; "An Analysis of the Cost of Production Data Collected in the Dallas News Cotton Contest, 1926." (Texas A. and M. College,)

Hudson, M. H.—B.S., Illinois, 1917; "The Manufacture of Corn Products in Illinois." (Illinois, 1928.)

Hug, Lester L.—B.S., Pennsylvania State, 1924; "A Social Survey of Locust Township, Columbia County, Pennsylvania." (Pennsylvania State College, 1927.)

Hunt, Robt. L.—B.S., Texas A. and M. College, 1924; "Farm Labor Union of America." (North Carolina State, 1927.)

Irving, Robt. N.—B.S.A., 1921; B.S., Education, Idaho, 1922; "An Economic Study of Kootenai County, Idaho." (Idaho, 1927.)

Jackson, Earl K.—B.S., Ohio, 1926; "The Farmers Source and Use of Market News." (Ohio, 1927.)

Jacoby, John R.—B.S.A., Conn., 1925; "Regionalization of Current Trends in Connecticut Agriculture." (Connecticut, 1927.)

Johnson, Sherman E.—B.S., Minnesota, 1924; "An Analysis of Organization Problems on Louisiana Farms." (Minnesota, 1926.)

Jones, Maurice D.—"Growing Peas for Canning in Maine." (Maine, 1926.)

Kendrick, Frank J.—B.S., Ohio, 1926; "The Influence of the Ohio Poultry Producers Cooperative Association on the Price of Eggs in Its Territory." (Ohio, 1927.)

King, Homer P.—B.S., Oklahoma, 1926; "Farm Income as a Basis for Oklahoma Farm Land Value." (Oklahoma, 1927.)

Kohlmeyer, John B.—B.S., Purdue, 1925; "Organization and Functions of Fluid Milk Cooperative Associations." (Purdue, 1927.)

Kreiselmaier, Walter F.—"Immigration in Reference to the United States and North Dakota." (North Dakota, 1927.)

Kuhrt, W. J.—B.S., Cornell, 1923; "Some Organization and Operating Problems of Farmers Elevators." (Minnesota, 1926.)

LaMont, Thos. E.—B.S., Cornell, 1927; (Not determined.) (Cornell,)

Lee, Hoon K.—Tokyo Imperial University, ; "A Study of Korean Farm Tenancy." (Kansas, 1927.)

Littlejohn, Lacy W.—B.S., Oklahoma, 1923; "The History and Present Status of Publicity in the Field of Agricultural Economics." (Oklahoma, 1927.)

Long, Glenn W.—Baker University, 1926; "The Control of State Highway Departments in the United States over State Highway Systems." (Kansas,)

Marshall, John, Jr.—B.S., Cornell, 1926; "Membership Relations of Milk Marketing Cooperatives." (Cornell, 1927.)

McDaniel, Guy Q.—B.S.A., Missouri, 1917; "The Application of Farm Management Survey Methods in County Agent Work." (Missouri, 1927.)

McLoughlin, John R.—South African Diploma of Agriculture; "Relation of Land Utilization to Agricultural Prosperity." (Minnesota, 1927.)

Mighell, Lester R.—B.S., Iowa State, 1925; "A Study of the Relation of Input to Output in the Dairy Enterprise on Steele County Farms." (Minnesota, 1926.)

Mitchell, Donald R.—B.S., Wisconsin, 1918; "Efficient Organization of Eighty-acre Farms in Southeastern Wisconsin." (Wisconsin, 1927.)

Montgomery, Geo., Jr.—B.S., Kansas, 1925; "Rural Population Problems." (Kansas, 1927.)

Montgomery, John T.—B.S.A., Purdue, 1924; "An Economic Study of the History, Present Situation, and Outlook for Agriculture on the Minidoka Irrigation Project." (Joint author with J. W. Barber.) (Idaho, 1927.)

Moore, Harry C.—B.S., Ohio, 1926; "The Ratio Between Sales and Appraised Value of Farm Real Estate in Ohio." (Ohio, 1927.)

Neff, J. C.—B.S., Ohio, 1920; "A Study of 44 Ohio Farms as a Basis of Determining Some Factors of Financial Success in Farming." (Cornell, 1927.)

Negaard, Ole—B.S., Minnesota; "Factors Affecting Marketing Differentials in Fluid Milk Prices." (Minnesota, 1928.)

Oldfield, H. G.—B.S., Toronto; "An Analysis of Recent Movements in Minnesota Land Values." (Minnesota, 1927.)

Olson, Victor J.—B.S., Wisconsin, 1925; "A Statistical Study of Factors Affecting Farmers' Earnings in Stevens County, Minnesota." (Minnesota, 1927.)

Owens, Wm. W.—B.S., Utah, 1916; "Marketing of Milk in Salt Lake City and Ogden." (Utah, 1927.)

Oyler, Merton—B.S., Ohio, 1926; "The Expenditure for Family Living of Sixty Ohio Farm Families during 1925 and 1926." (Ohio, 1928.)

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